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volume 2: archaeology

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THE "POOR POTTER" OF YORKTOWN:
A STUDY OF A COLONIAL POTTERY FACTORY
VOLUME 2: ARCHAEOLOGY
COLONIAL NATIONAL HISTORICAL PARK VIRGINIA

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VOLUME 2. ARCHAEOLOGY

INTRODUCTION

Previous chapters have alluded to the fact that documentary information on the Yorktown Pottery Factory complex is very limited. York County probate inventories suggest that production may have begun as early as 1715 and a dated locally made pot found during excavations indicates that one kiln was in operation by 1720. Excavation has also recovered evidence that the pottery forms made at Yorktown show both English and Germanic influences. The origin and identity of the master potter or potters, however, remain unknown. Although the exact nature of Roger's involvement in the actual operation of the factory remains uncertain, it is likely that he owned the factory yet unlikely that he was a potter. Considering his other business activities it is probable that a hired employee oversaw day to day operations even if Rogers acted as general supervisor and owner.

In order to run an enterprise the size of the Yorktown complex, William Rogers must have needed a large number of laborers, both skilled and unskilled. A search of the York County records failed to turn up any evidence that Rogers employed free labor in producing his wares or that there were any potters living in the area. An effort to link Rogers and his known servants or business associates with English or German potters also failed, but negative evidence of this sort does not rule out the possibility that such a connection existed. Rogers may well have employed one or more skilled English and/or European potters, either as free day workers or as indentured servants.

During the early years of the factory's opening Rogers probably relied heavily on the labor of indentured servants. From 1714 to 1739, Rogers owned at least eight servants, including both men and women (see Appendix II, Volume 1). There is no indication that any of these servants were skilled in pottery making, but many necessary jobs did not require special skills. What is obvious from the documents is that Rogers increasingly began to rely on the labor of Negro slaves to run the factory. When Rogers died in 1739 he no longer owned any indentured servants, but he had acquired nearly forty slaves. A recent study of Virginia's colonial iron manufacturing industry has shown that skilled as well as unskilled slave labor was an essential element in the industry's growth and expansion before the Revolution.

The most conclusive evidence that slave labor was used at the Yorktown factory dates from 1760, after the complex had shut down. In that year one of Rogers' daughters brought a case to court in an attempt to claim part of her fathers estate. A letter from her attorney advised her that "you will not have a right to any profits from the Pot house as you had no right to the Slaves." It is not possible to determine just how profitable the pottery making enterprise had been, but this letter implies that the business continued to make money for some time after Rogers died. We can at least conclude that Rogers would have employed as many as 30 slaves and servants in various jobs connected with the manufacture of ceramics.

When Rogers died in 1739, he was survived by his wife, one sone, and three daughters. Within a few years the son and one daughter were dead and another daughter had left Virginia. The work at the pottery factory probably continued under the supervision of his widow or one of his son-in-laws, a sea captain. There are indications that the factory continued to produce ceramics until 1745 and perhaps later. On the other hand, it is likely that the quantity of wares begin produced had decreased even before Rogers died, and the firing of the factory's kilns may have been infrequent after the mid-1730's.

One of the best links between Rogers and the pottery factory is the Inventory and Appraisal of William Rogers Estate, dated December 17, 1739 [see Appendix IB, Volume 1]). The following items, listed in this inventory, make it probable that Rogers indeed had a definite connection with the pottery factory, as a person without this connection would not have had the amount and kinds of materials listed:

a pr. large Scales & weights
a pcel crakt redware
a parcel crakt Stone
11 pocket bottles
1 horse mill
2300 lb. old Iron [for iron oxide?]
26 doz qt. Mugs
60 dox. pt. Do.
11 doz Milk pans
9 large Cream potts
9 Midle Sized Do
12 small Do.
2 doz. red Sauce pans
2 doz. porringers
6 Chamber potts
4 doz. bird bottles
3 doz. Lamps
4 doz. small stone bottles
4 doz. small dishes
6 doz. puding pans
26 Cedar pailes
40 bushels Salt

The number of pots listed above add up to a considerable number - 1,511 pottery vessels, clearly out of range of an ordinary consumer.

It is curious to note that, despite the large size of the pottery factory, no documentary evidence has been found concerning the physical aspects of the factory itself. We know nothing about it from historical sources. The only mention, in fact, of the existence of the "poor potter" is in Governor Gooches' dispatches to the English Board of Trade in the years 1732-1741 [see Chapter 4].

Archaeological research has revealed the extent and characteristics of the Yorktown Pottery Factory, located on lots 51 and 55 (Figures 16-17). We now know that the "poor potter" mentioned by Governor Gooch was a misnomer and a vast understatement. In Yorktown, between the years c.1720 and c.1745, a very large pottery industry existed that produced a large variety of ceramic products. In fact, the factory complex is the largest one known to date in colonial American as well as in England [early 18th C.]. Experienced

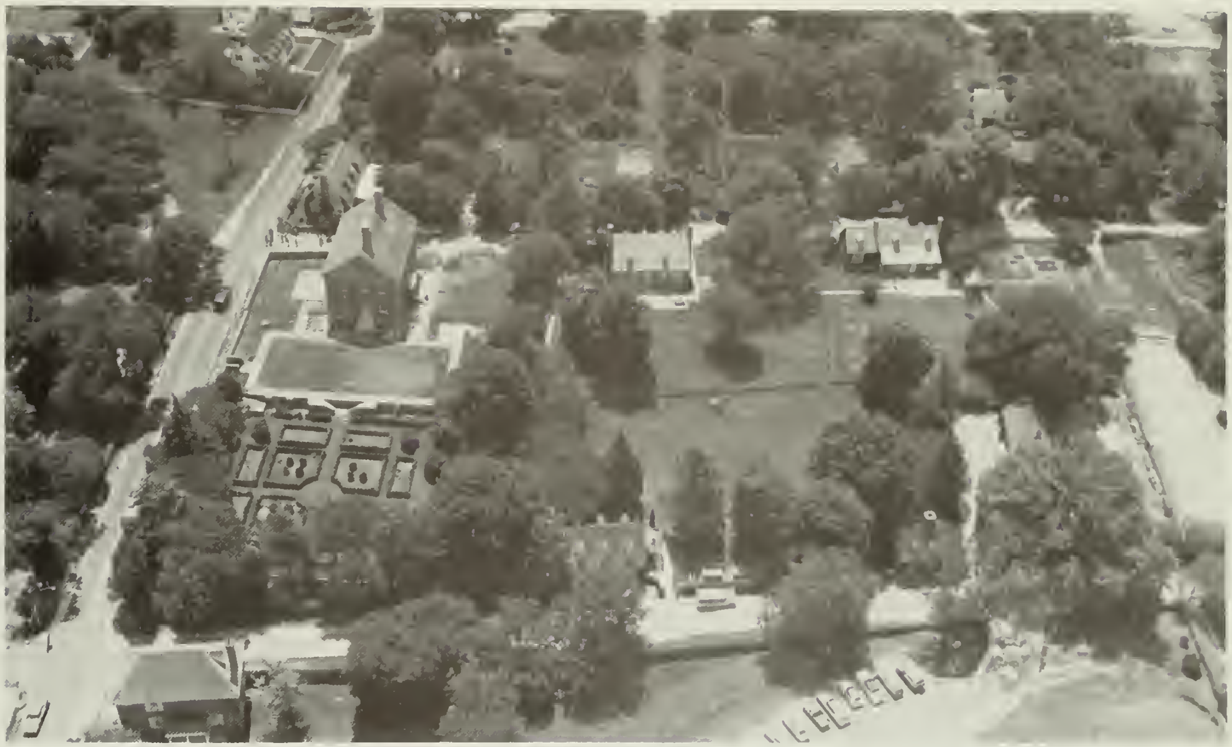


Figure 16. Aerial view of Yorktown, with pottery factory at center right. Looking southeast.

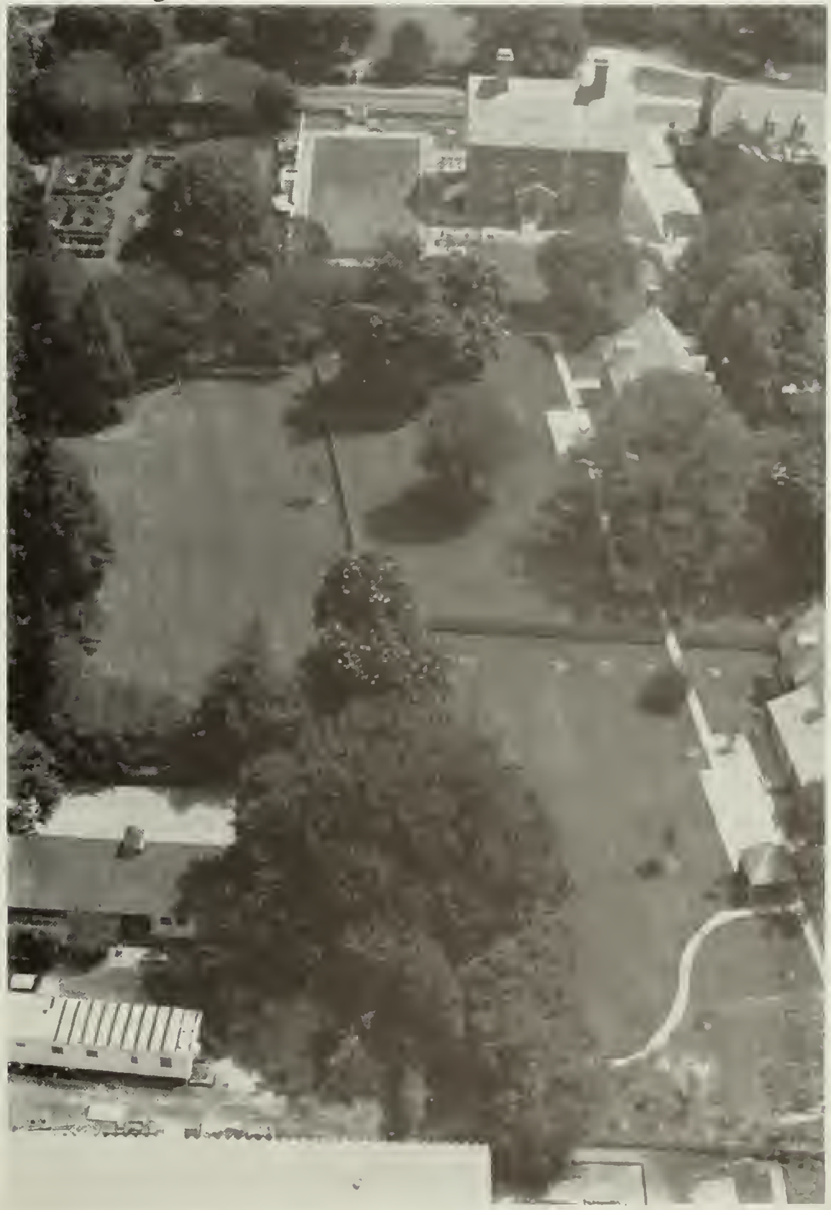


Figure 17. Aerial view, with pottery factory at bottom of photo. Looking northeast.

potters worked with well designed and well built kilns and factory buildings. The factory is also noteworthy because it produced the first stoneware made in America.

The dates of operation of the Yorktown factory are unknown from historical records. Dates associated with its operation are as follows: 1725 - an entry in John Mercer's ledger reveals that Rogers was selling earthenwares wholesale; the correspondance of Governor Gooch to the Board of Trade mentions the "poor potter" for the first time in 1732 and for the last in 1741; the Estate Inventory of William Rogers, dated 1739.

The proposed dates for the operation of the pottery factory - c.1720 to c.1745 - are derived from archaeological and historical evidence. The earlier date comes from the lead glazed porringer with the initials AC and the date 1720 incised on the rear exterior of the pot. This pot, made at the factory, was intentionally buried near the Large Kiln [see later discussion]. The pottery factory, or portions of it, were thus certainly in existence by 1720. Evidence from probate inventories may indicate a date of c.1715 for the start of the factory. Beginning at this time there is an increase in the mention of local ceramics, especially stonewares, possibly indicating the availability of a local supply of ceramics, namely the Yorktown factory.

William Rogers died in 1739, and as previous chapters have pointed out, there are indications that the pottery operations fell on hard times after that. It also seems probable, as mentioned previously, that Rogers daughter and son-in-law carried on the business to about 1745 or perhaps 1750.

Archaeological research at the pottery site began in 1966, when N. Barka excavated a large waster pit (Waster Pit No. 1) on Lot 51). This was the first definite indication of the location of the "poor potter". From 1966 to 1970, Barka and students from the College of William and Mary carried out a program of archaeological testing in a limited portion of the site. In the fall of 1970, the Large Kiln was discovered and subsequently excavated.

During the summer of 1972, Barka and a crew of students excavated Structures 1, 2, 3, and 4. This work, the first to be sponsored by the National Park Service, uncovered the workshop room and buildings interconnected with the Large Kiln.

In the fall of 1975, William and Mary personnel began the excavation of the Small Kiln.

In 1979-1981, the excavation of the Small Kiln was completed and further testing was done in the area of Structures 5 and 6, Waster Pit no. 2, as well as other areas of Lots 51 and 55.

The main analysis of ceramic products uncovered was carried out during the same period.

Approximately 40%-50% of the site (Lots 51 and 55) has been tested or excavated (Figures 18 and 19). The major structural finds include two pottery kilns, a workshop building complex, several post structures, and two waster pits. These features and others will be described in detail in the following chapters.

As mentioned above, the Yorktown Pottery Factory was a large operation for its time, consisting of a symmetrical complex of buildings and features. The probable main factory complex consisted of a row of interconnected buildings or rooms and kilns, located on the east side of Lots 51 and 55. The complex measured approximately 170 ft. in north-south length and 20 to 22 ft. in width, extending from the edge of Read Street to within c.100 ft. of Nelson Street (both original streets). The Large and Small Kilns were situated toward the southern end of the complex. Apparently pots were thrown, dried, glazed on one end of the complex, and fired on the other - a well-thought out concept.

It is believed that the archaeological research has uncovered the major components of the 18th C. pottery factory. Additional excavation might be expected to find more domestic or workshop buildings, possibly more waster pits, and a well. The latter would be an important find only if the well had been used to dispose of wasters.

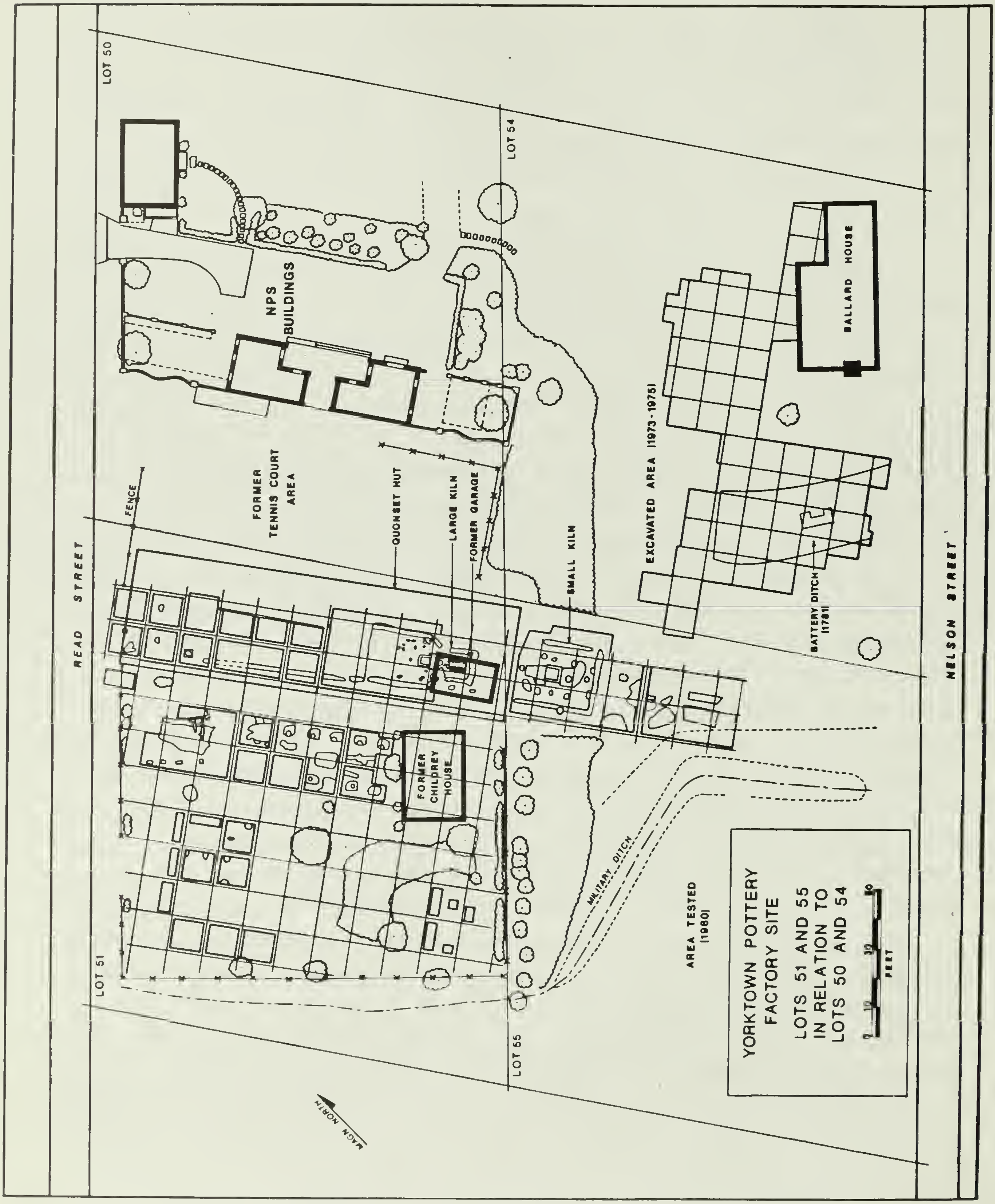

YORKTOWN POTTERY FACTORY SITE
LOTS 51 AND 55 IN RELATION TO LOTS 50 AND 54
0 10 20 30
FEET
READ STREET
NELSON STREET
LOT 50
LOT 51
LOT 54
LOT 55
NPS BUILDINGS
FORMER TENNIS COURT AREA
FENCE
QUONSET HUT
LARGE KILN
FORMER GARAGE
SMALL KILN
EXCAVATED AREA (1973-1975)
BALLARD HOUSE
BATTERY DITCH (1781)
FORMER CHILDREY HOUSE
MILITARY DITCH
AREA TESTED (1980)
MAGN NORTH

FIGURE 18

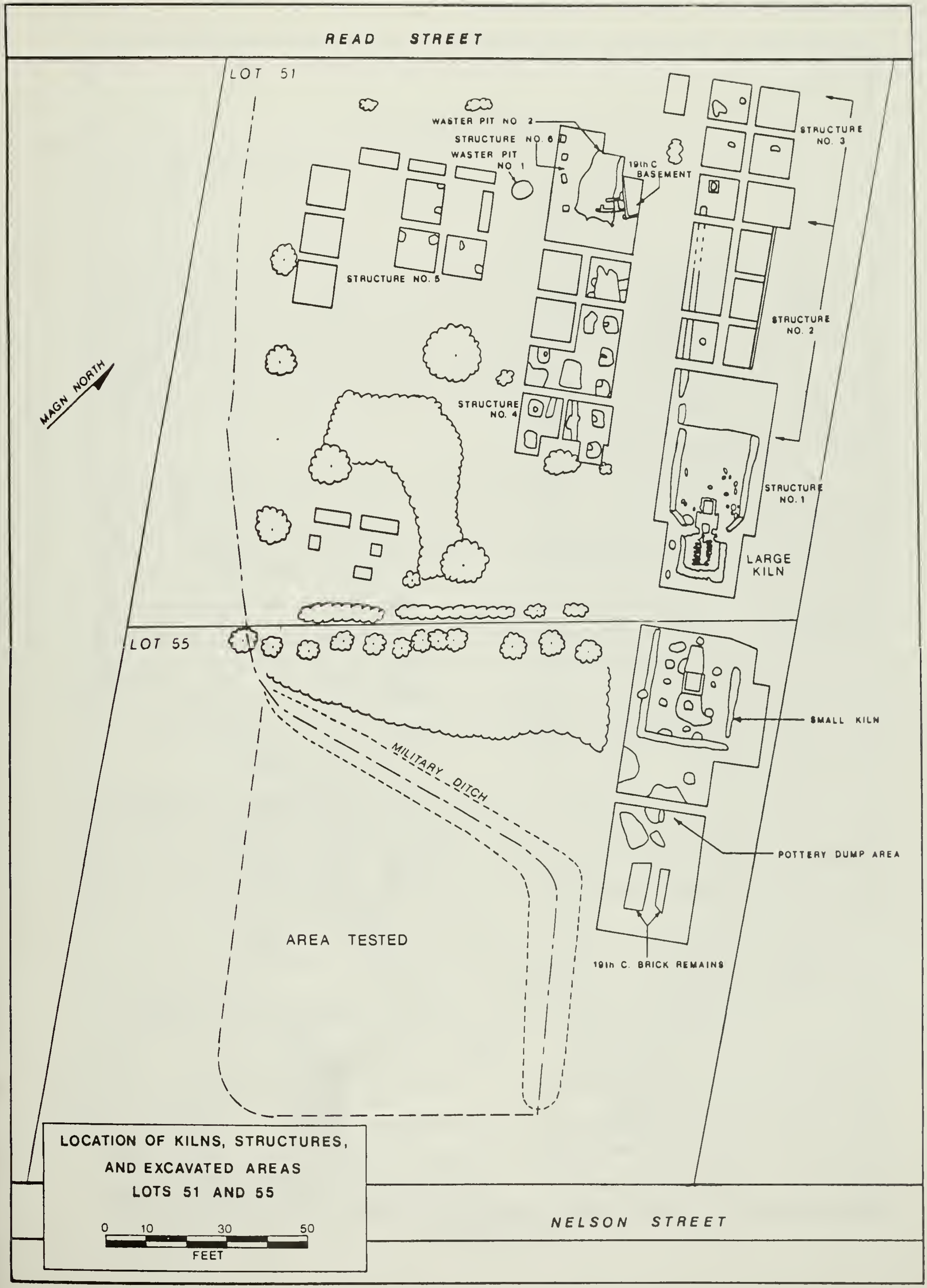

READ STREET
LOT 51
WASTER PIT NO 2
STRUCTURE NO. 6
WASTER PIT NO 1
19th C BASEMENT
STRUCTURE NO. 3
STRUCTURE NO. 5
MAGN NORTH
STRUCTURE NO. 2
STRUCTURE NO. 4
STRUCTURE NO. 1
LARGE KILN
LOT 55
SMALL KILN
MILITARY DITCH
POTTERY DUMP AREA
AREA TESTED
19th C. BRICK REMAINS
LOCATION OF KILNS, STRUCTURES, AND EXCAVATED AREAS LOTS 51 AND 55
0
10
30
50
FEET
NELSON STREET

FIGURE 19

CHAPTER 5

THE LARGE KILN

The Large Kiln, built of brick and marl, was rectangular in shape and of the updraft type, consisting of a lower heat chamber and an upper pot chamber. Archaeological remains consist of the majority of the lower heat chamber, which is preserved to a maximum height of 3.47 ft. or 75% of its original height. (Figures 20-40).

The kiln and an adjoining room immediately north of the kiln had been constructed in a large excavated hole measuring 37 ft. by 22 ft. (maximum) [13.3 ft. wide at the kiln]. The potters had dug to a depth of c.4.4 ft. below ground surface, mostly into a yellow sand subsoil. The lower one-third or so of the kiln - the majority of the heat chamber - was therefore situated below ground level, with the floor of the pot chamber at approximately ground level. The below ground position of the heat chamber undoubtedly enabled greater retention of heat. (Figures 22,24).

Structure 1, adjacent to the kiln, is bounded on the south by the kiln (actually the stoke hole pit), on the east and west by marl walls, and on the north by steps cut into subsoil which lead into a large structure, the presumed main Workshop Building (Structure 2).

The Large Kiln is a well planned, well built structure, symmetrical in plan. A firebox and stoke hole project from the north side into the center of Structure 1. The kiln itself is rectangular in shape, with maximum dimensions of 21.6 ft. (north-south) by 13.3 ft. (east-west). The kiln remains will be divided into four parts for discussion purposes: 1). the Flue-Arch-Vent area; 2). Firebox with adjacent Stoke Hole Pit; 3). adjacent brick and marl walls and the Corridor; 4). the Workshop Room (Structure 1) to the immediate north of the kiln.

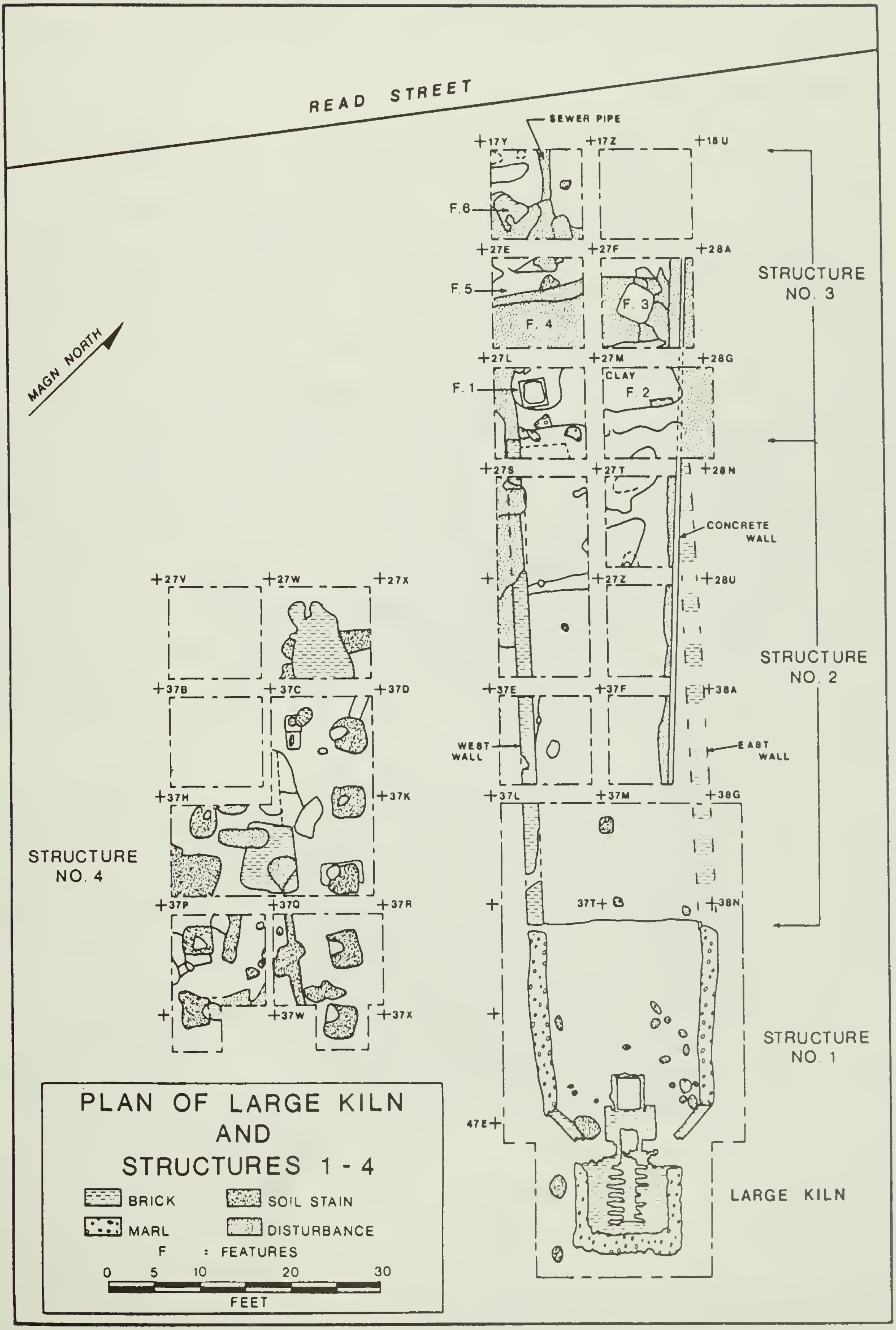

READ STREET
SEWER PIPE
MAGN NORTH
17Y
17Z
18U
F.6
27E
27F
28A
F.5
F. 4
F. 3
27L
27M
28G
F. 1
CLAY
F. 2
27S
27T
28N
CONCRETE WALL
27Z
28U
37E
37F
38A
WEST WALL
EAST WALL
37L
37M
38G
37T
38N
47E
STRUCTURE NO. 3
STRUCTURE NO. 2
STRUCTURE NO. 1
LARGE KILN
27V
27W
27X
37B
37C
37D
37H
37K
STRUCTURE NO. 4
37P
37Q
37R
37W
37X
PLAN OF LARGE KILN AND STRUCTURES 1 - 4
BRICK
SOIL STAIN
MARL
DISTURBANCE
F : FEATURES
0
5
10
20
30
FEET

FIGURE 20

Flue-Arch-Vent Area

The central brick portion of the lower heat chamber consisted of a main flue spanned by arches separated from one another by vents. (Figures 20-32). This portion of the kiln served as a conduit for the circulation of hot air and also as a foundation for the pot chamber above. The entire flue-arch-vent area is constructed of red, non-fire brick. Vertical brick walls originally extended upward from the outer poritons of this area to envelope or contain the heat generated in the firebox, which connects with the flue on the north side of the kiln. The floor of the heat chamber was formed by the top of the arch system.

The flue-arch-vent area, exclusive of the firebox and stoke hole pit, measures 8.5 ft. square. It survives to a maximum height of 13 courses of brick, or 3.32 ft. above sterile soil. Bricks measure 8-1/2 x 4-1/4 x 2 inches, with occasional smaller or larger sizes. The bricks were set in shell mortar. A layer of clay was smeared on any exterior brick surfaces, presumably to prevent further heat leakage. This clay layer is now red in color due to heat.

The flue measures 2.2 ft. in width and 6 ft. in length (to where it connects with the firebox). The floor of the flue slopes gently from south (highest) to north, where it connects with a short, steeper slope measuring 37°, and the horizontal and lower floor of the firebox (1.61 ft. lower than the highest point of the flue). The total flue-firebox length is 11.7 ft.

The flue was formed by a series of six parallel arches, each separated by spaces or vents. The arches were catenary in shape, the mid-point of each reaching an estimated 3 ft. from the flue floor. Presently, the arches survive to various elevations, the highest being 1.84 ft. above the flue floor. The arch angle is presently about 19° inward from the vertical. The arch supports, as well as each arch, are one brick in width. It is also probable that an additional arch was placed over the junction of the flue with the firebox.

The arches were separated from one another by a half-brick

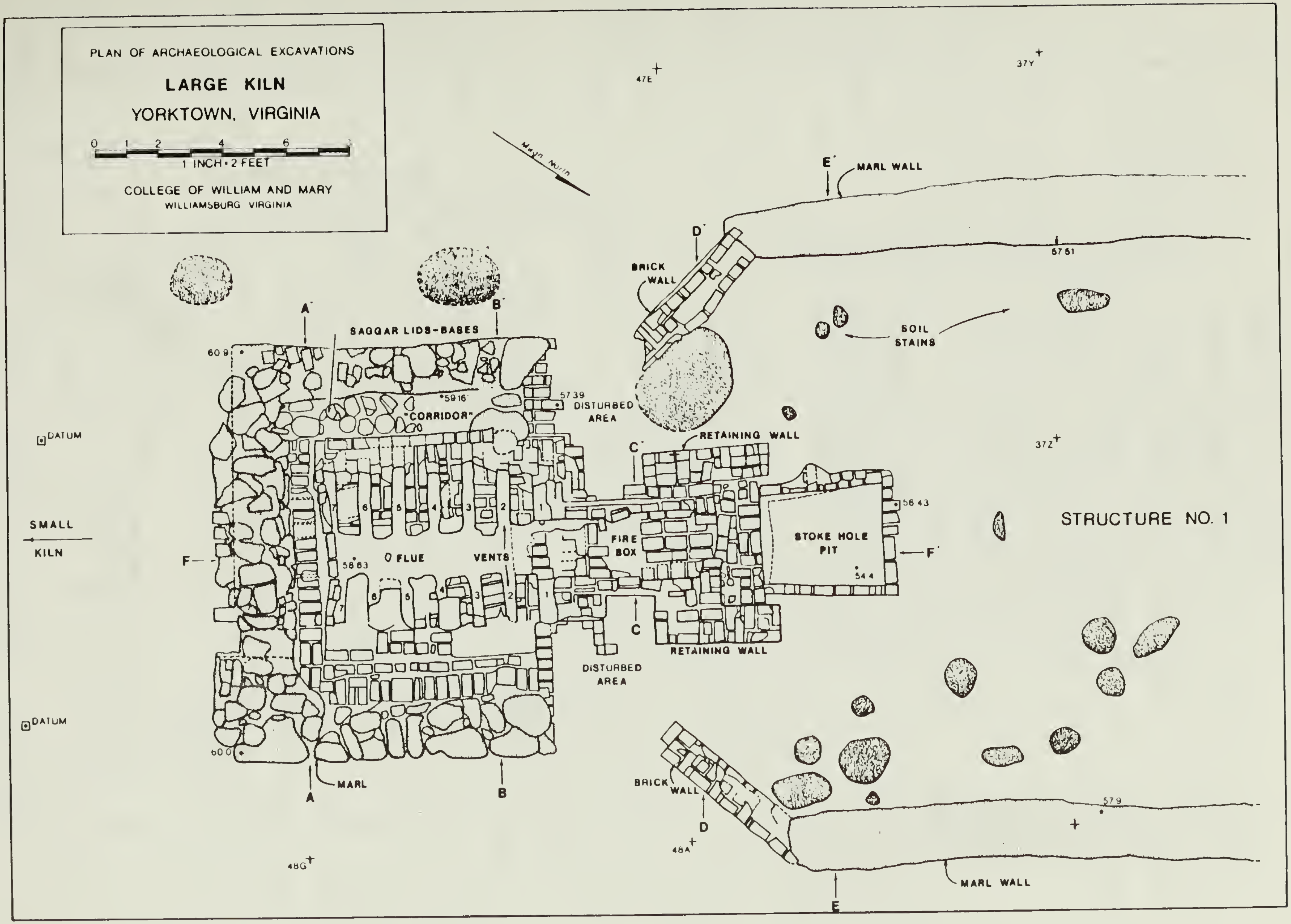

PLAN OF ARCHAEOLOGICAL EXCAVATIONS
LARGE KILN
YORKTOWN, VIRGINIA
0 1 2 4 6 8
1 INCH • 2 FEET
COLLEGE OF WILLIAM AND MARY
WILLIAMSBURG VIRGINIA
47E
37Y
Magn North
E'
MARL WALL
D'
BRICK WALL
57.61
SOIL STAINS
A'
B'
SAGGAR LIDS-BASES
60.9
59.16
"CORRIDOR"
57.39
DISTURBED AREA
RETAINING WALL
C'
37Z
DATUM
SMALL
KILN
F
58.83
FLUE
VENTS
1
2
3
4
5
6
7
FIRE BOX
STOKE HOLE PIT
56.43
54.4
F'
STRUCTURE NO. 1
C
RETAINING WALL
DISTURBED AREA
DATUM
60.0
A
MARL
B
BRICK WALL
D
48A
57.9
48G
MARL WALL
E

FIGURE 21

or four inch space, here called a vent area. Seven vents originally paralleled the six arches across the width of the heat chamber. The vents, as the arches, were at right angles to the flue. The vents or openings enabled hot air from the flue to be transferred upwards to the heat chamber.

In cross-section, each vent curved upwards and outwards toward the west or east respectively. The lowest level of each vent is at the same level as the flue floor and the base of the arches, while the uppermost level is presently c.1.6 ft. above the same floor. The vents originally extended about one foot or more into the pot chamber, ending at the same level as the upper surface of the arches which, once again, formed the floor of the upper chamber.

The maximum surviving horizontal length of the vents is 1.8 ft. (east-west). When in operation, the kiln vents extended nearly the full width of the flue-arch-vent area, or c.6 ft. The northernmost vent is situated immediately above the southern edge of the firebox and seems to have been shorter in length than the other vents.

The entire interior surface of the arches and vents is covered by a fairly thick coating of bluish-green salt glaze. This continuous sheet of glaze makes it impossible to clearly discern interior brick construction techniques. The floor of the flue is very heavily salt glazed. The salt is especially thick at the bases of arches and vents where glaze runoff has occurred. In these areas, as well as at one location in the middle of the flue floor, numerous clay spacers were found stuck in place, having fallen through the vents from use in the upper pot chamber. The significance of the salt glazing will be discussed later in the report.

The flue-arch-vent area is bounded on the south by a thin red brick wall, which has leaned severely inward toward the flue. This wall is presently six brick courses high (c.1.4 ft.) and one-half brick wide. The flue side of the wall exhibits a continuous salt glaze. The oppositie or south side of the wall is not glazed,

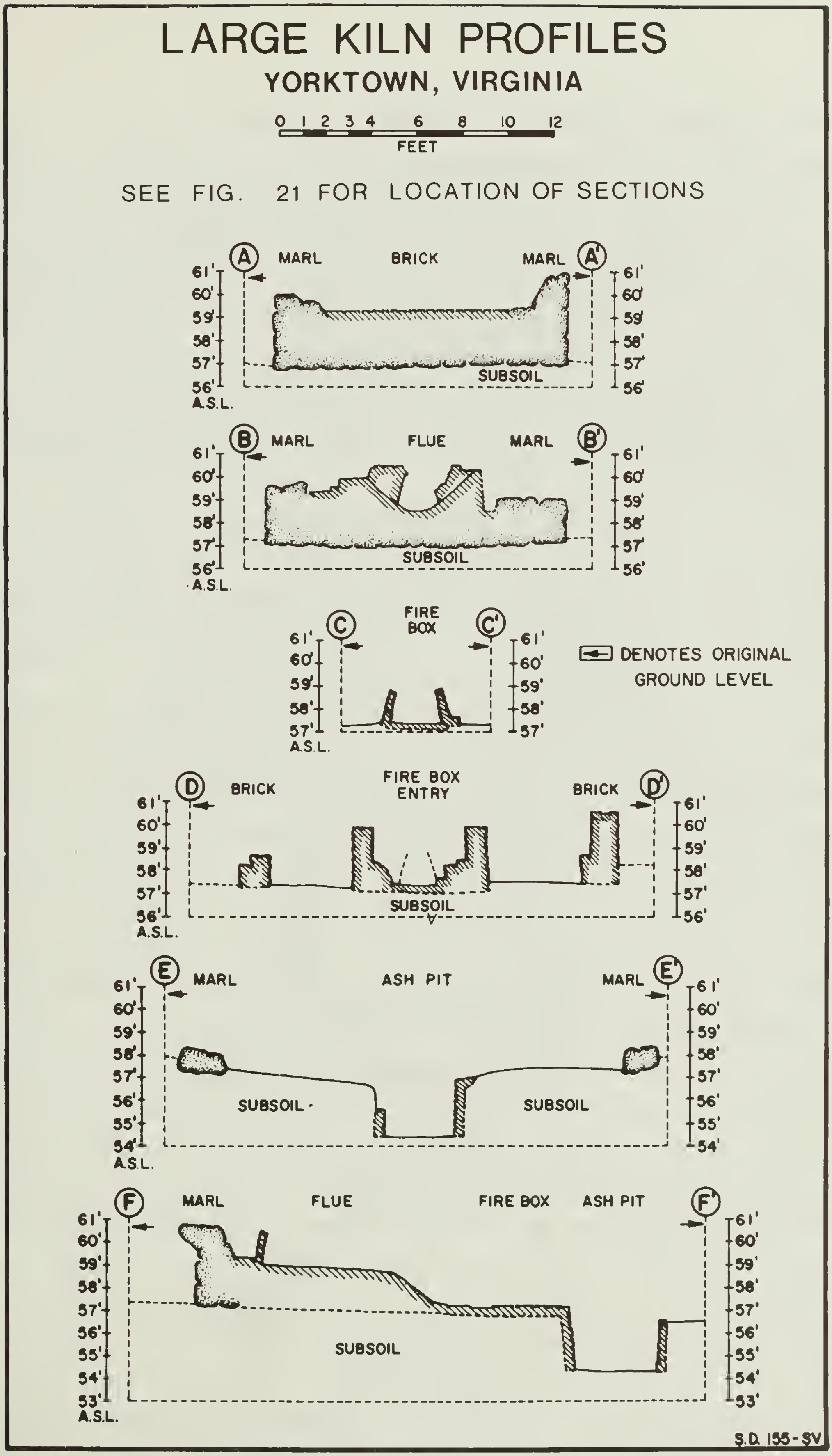

LARGE KILN PROFILES
YORKTOWN, VIRGINIA
0 1 2 3 4 6 8 10 12
FEET
SEE FIG. 21 FOR LOCATION OF SECTIONS
A
MARL
BRICK
MARL
A'
SUBSOIL
B
MARL
FLUE
MARL
B'
SUBSOIL
C
FIRE BOX
C'
DENOTES ORIGINAL GROUND LEVEL
D
BRICK
FIRE BOX ENTRY
BRICK
D'
SUBSOIL
E
MARL
ASH PIT
MARL
E'
SUBSOIL
SUBSOIL
F
MARL
FLUE
FIRE BOX
ASH PIT
F'
SUBSOIL
61'
60'
59'
58'
57'
56'
55'
54'
53'
A.S.L.
S.D. 155-SV

FIGURE 22

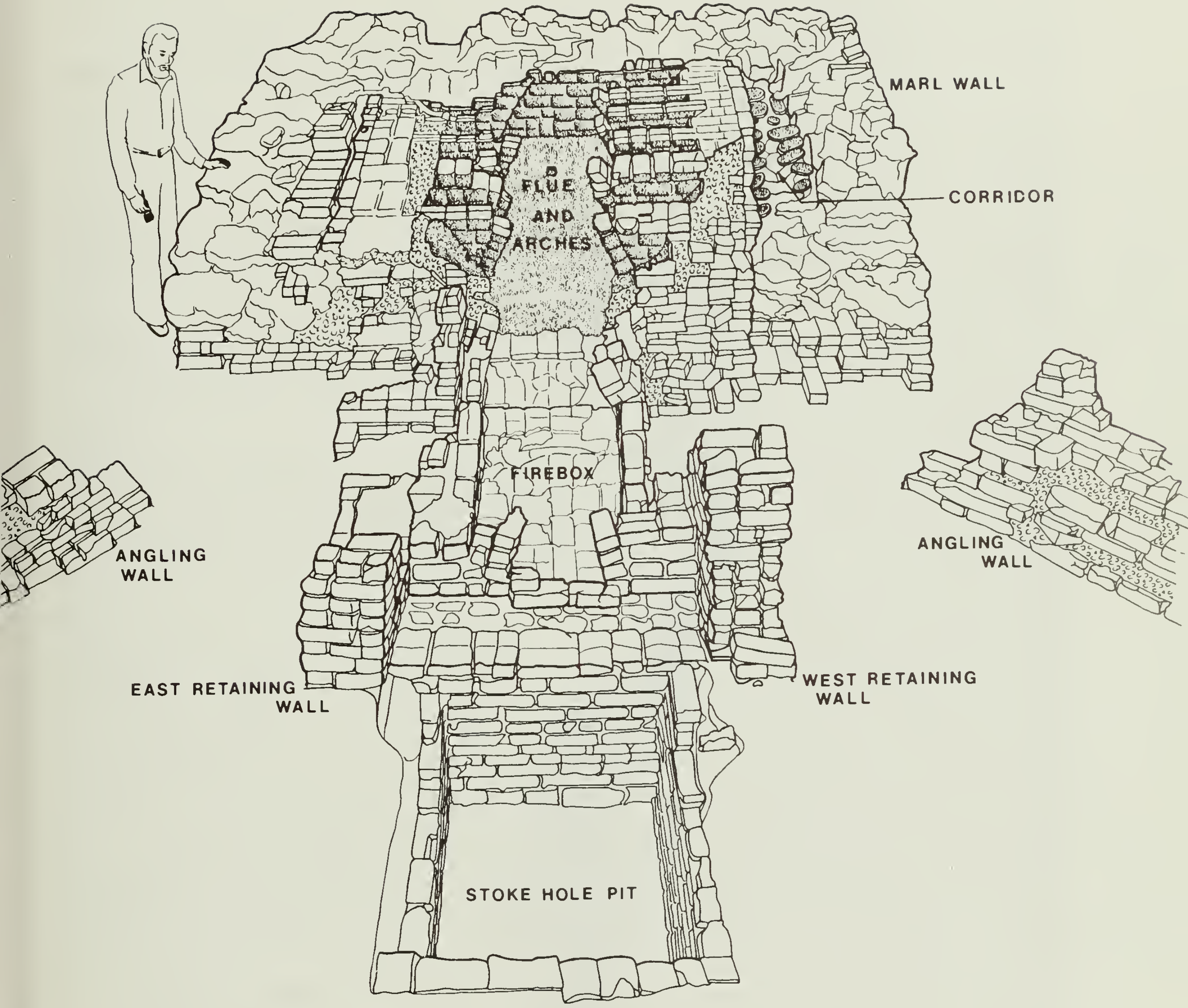
but exhibits large patches of reddish mortar.

Between this wall and the marl wall is a row of red bricks, one brick wide, laid flat to form a 'corridor-like' passage. However, mortar still present on the upper surface of these bricks and on the south side of the brick wall indicate that a brick wall once extended vertically in this area. This wall, in addition to the brick wall, would have been 1-1/2 bricks in width. This situation seems probable, as the brick wall by itself would have been too thin to withstand the air pressures built up inside the kiln.

The fill from the area immediately south of the brick wall consisted of a lower red rubble layer 0.4 ft. in thickness, which contained many brick bats glazed on one side, possibly derived from the brick wall. An upper brown soil layer contained much glazed brick as well.

The east side of the flue-arech-vent area did not have a 'corridor'. Instead this area was bricked up through the use of red bricks and occasional red floor tiles (unglazed).

When found, the flue-arch-vent area was filled with a 1.7 ft. deep deposit of soil, artifacts, rubble and kiln debris. Three basic strata were discerned: 1). a lower fluffy and soft brown soil, 0.5 ft. to 0.75 ft. in thickness, rested upon the flue floor and partially filled the vents. This stratum was probably contemporary with the operation of the kiln. Artifacts contained in this level consisted mostly of kiln furniture - spacers or props and pads which had fallen through the vents from the pottery chamber above, as well as fragments of salt glaze. In one vent, ten props were discovered. A group of c.50 props and pads were found resting on the flue floor near the south end of the flue. Occasional props were also found stuck to the flue floor or arch bases. 2). a reddish rubble layer, measuring 0.7-0.8 ft. in thickness, formed a second stratum above Stratum 1. This stratum dates from the destruction level of the kiln and contents consist of glazed and unglazed brickbats, fragments of mortar, and occasional sherds. 3). a thin upper stratum of brownish sand was positioned



PERSPECTIVE DRAWING OF LARGE KILN

FIGURE 23

between the underlying reddish rubble layer and the topsoil. It contained occasional rubble and modern sherds.

Firebox and Stoke Hole Pit

The firebox is the area of the kiln where heat was generated through the combustion of wood logs. Heat traveled into the kiln flue and up, through vents, into the pot chamber.

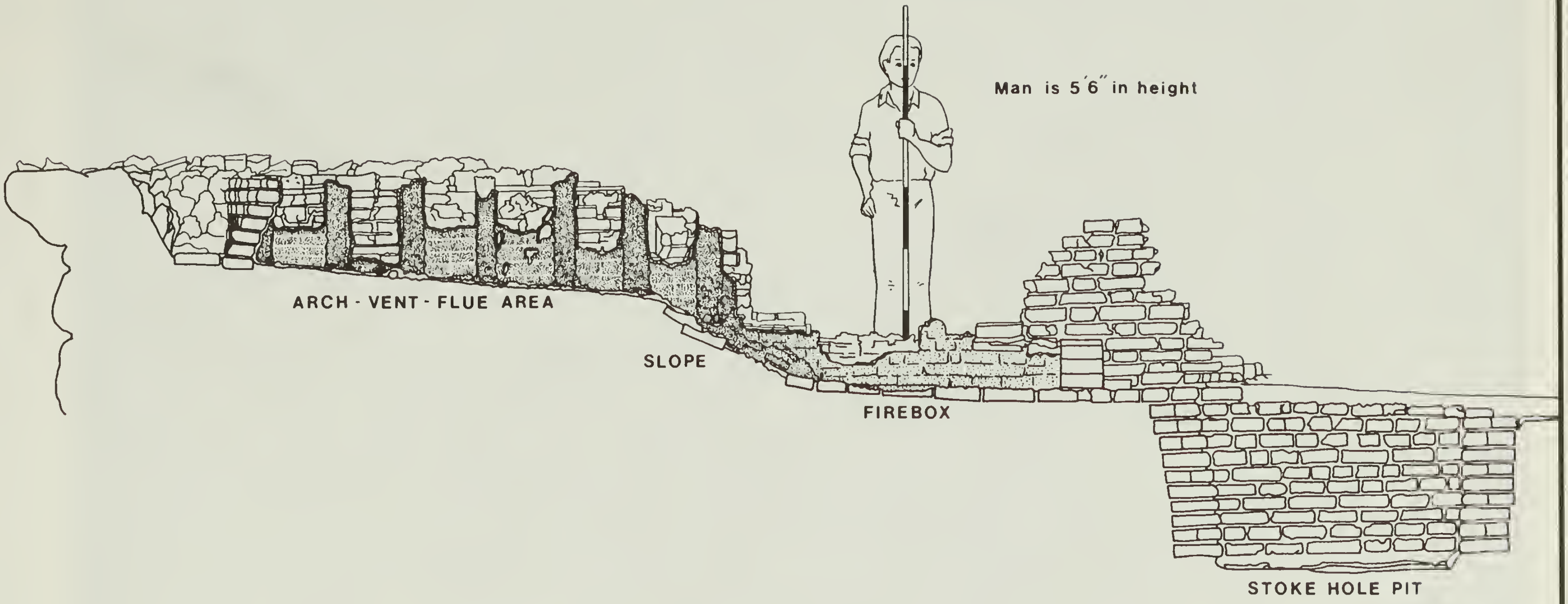
The firebox extended from the north side of the kiln, flanked in turn by a stoke hole pit. Both structures were constructed entirely of brick. (Figures 32-40).

The firebox, which connects with the flue, measures the same width as the flue - 2.2 ft. The firebox, which has a flat brick floor, extends for a length of 4 ft. from an arched firemouth on the north to a point where the floor rises at an angle of 37° to meet the sloping flue floor.

The two parallel walls of the firebox survive to a height of 1.8 ft. Both walls are continuously glazed on the inner (toward fire) surface. The glaze is courser than the salt glaze found on the flue-arch-vent surfaces, and was caused by the melting of the brick due to the extreme heat generated from the fire. The firebox floor brick are heavily fire-effected, but not glazed. The firebox walls also show evidence of rebuilding, as occasional bricks with glazed surfaces are noticeable in the outer surfaces of the walls.

The upper brick course of the firebox walls curve inward slightly and suggest that an arched roof covered the firebox. This seems logical in that brick could not have been laid horizontally unless placed on an iron platform of some sort.

When first excavated, a low arched firemouth was present on the north side of the firebox. The opening of the firemouth measured 1.5 ft. in height and 1.2 ft. in width. This feature, although recorded by photography (Figures 33-35), was subsequently destroyed by vandals. Like the firebox as a whole, the firemouth had been constructed of red brick laid in mortar, both made



LENGTHWISE (NORTH-SOUTH) CROSS-SECTION THROUGH LARGE KILN

FIGURE 24

redder in color from the heat generated therein. The inner surfaces of the firemouth are blackened.

The firebox is flanked on both sides by brick retaining or support walls (Figure 38). Each wall is laid in Flemish bond and is 1-1/2 bricks wide (1.1 ft.). The west wall survives to a height of 12 courses (2.6 ft.) and the east flanking wall is 8 courses (c.1.9 ft.) in height. Both walls are constructed of yellow brick, contrasting with the redness of the firebox bricks.

Both walls are each 4 ft. in length and therefore do not extend the full length of the firebox. The north end of each wall extends c.1.8 ft. beyond the firemouth, forming boundaries for a short brick platform that continues between the firemouth and stoke hole pit. This platform, which is a continuation of brickwork at the firebox floor level, measures 4.0 ft. in length (east-west, between the two flanking yellow brick walls) and 1.4 ft. in width (north-south, between the firemouth and south edge of the stoke hole pit). Unlike the bricks of the firebox, the bricks of this platform are not glazed by heat. The platform served as a small loading-utility area between the stoke hole pit and firemouth.

To the immediate north of the firebox, separated from it by the above-mentioned platform (a distance of 1 ft.), there is a brick-walled box with a dirt (subsoil) floor, here referred to as a stoke hole pit. The floor of this pit, as found, is nearly 2-1/2 ft. below the level of the firebox floor. By standing in the hole, the potter could more easily load logs into the firebox and stoke the fire, when needed.

The stoke hole pit may also have served as a temporary repository for the hot coals and ash raked out from the firebox through the firemouth. When found, the stoke hole pit contained numerous strata of ash (see later discussion). (Figures 34,35). The absence of a brick floor leads to the inference that water may have been thrown onto hot coals situated in the stoke hole pit. The stoke hole pit may have served another function as well. When on occasion the temperature in the kiln was too high, the

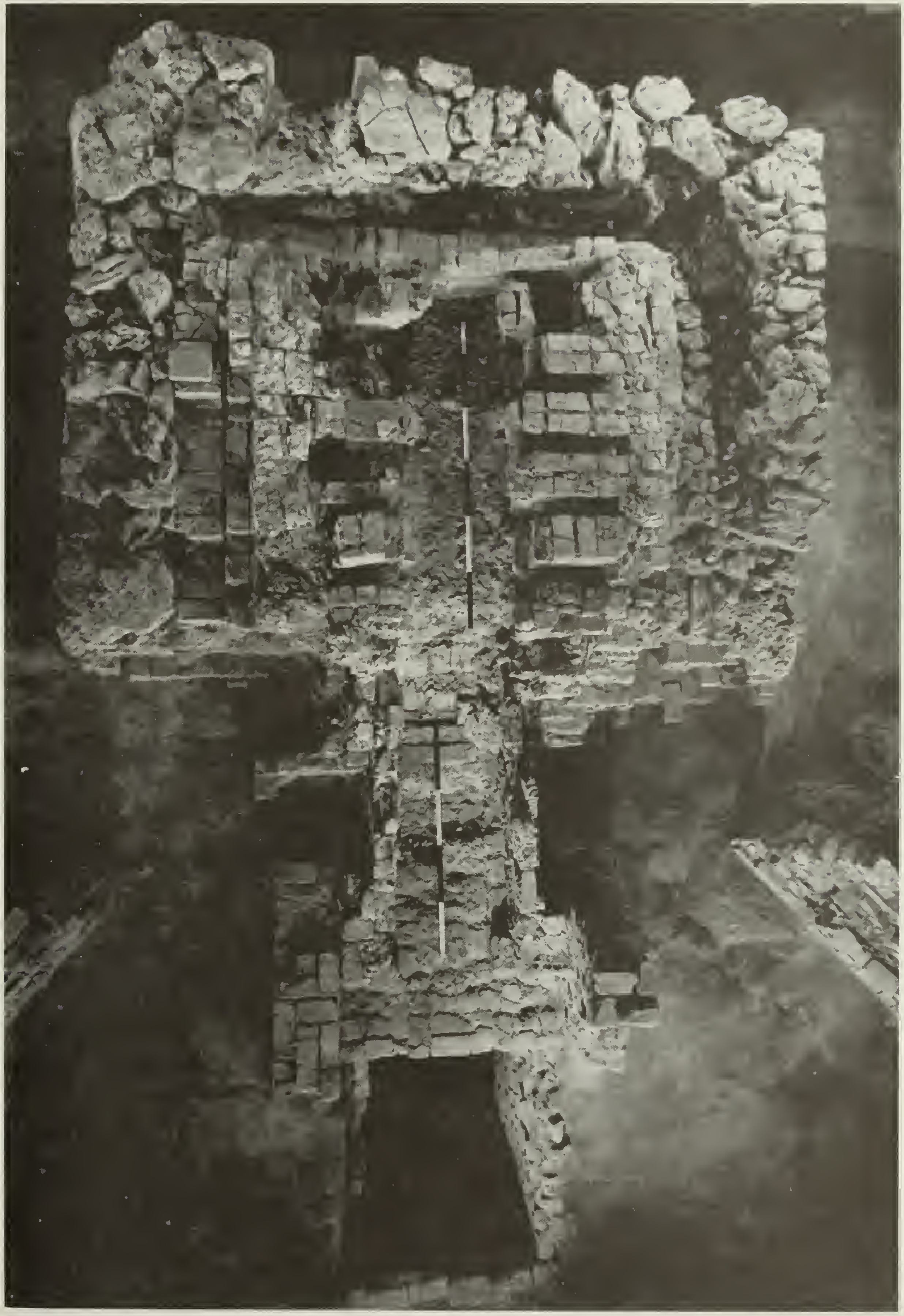


Figure 25. Plan view of Large Kiln. North at bottom.

fire could be drawn or raked out through the stoke hole into the stoke hole pit, thereby reducing the temperature. Regulation of temperature was mainly carried out through covering or uncovering openings in the roof of the kiln.

The stoke hole pit is slightly trapezoidal in plan, the end nearest the firebox being slightly narrower than the opposite or north end. The pit is 4 ft. in length (north-south) and presently measures a maximum of 2.65 ft. in height. Originally, all four walls were built of 13 courses of red brick, but presently survive to heights varying between 9 and 11 courses. During use, as is shown by mortar patterns on the lowest brick courses and by the presence of ash-charcoal strata beneath the brick walls, the potters must have knocked out several courses of lower brick. They did this by shoveling out ash, etc., gradually removing subsoil as they worked and gradually digging deeper within the confines of the stoke hole pit. The upper courses of brick were at the subsoil floor level of the room in which the stoke hole pit was situated.

The fill of the firebox, platform area, and stoke hole pit was of similar soils and deposition. Within the firebox, the following strata were found: 1). a brown layer was situated immediately above the firebox floor, measuring c.0.5 ft. in thickness. Occasional sherds, as well as kiln furniture, charcoal and mortar fragments, and occasional brickbats, were found in this stratum. On one poriton of the firebox floor, a concentration of 25 props was found, as well as saggar fragments, pads, light green bottle glass, several wine bottle kickups, stoneware sherds, several pipkin and bird bottle fragments, and pieces of animal bone. Patches of white or grey ash were often present as well. In some places, a thin lens of white ash was found immediately on top of the firebox floor. 2). a red brick rubble stratum overlay the brown layer and dates to the destruction of the kiln complex. The stratum contained numerous bricks and bats, as well as several large glaze-mortar-brick conglomerates, which once were a part of the kiln structure. The brick rubble was often deeper in the center of the firebox than at the edges.

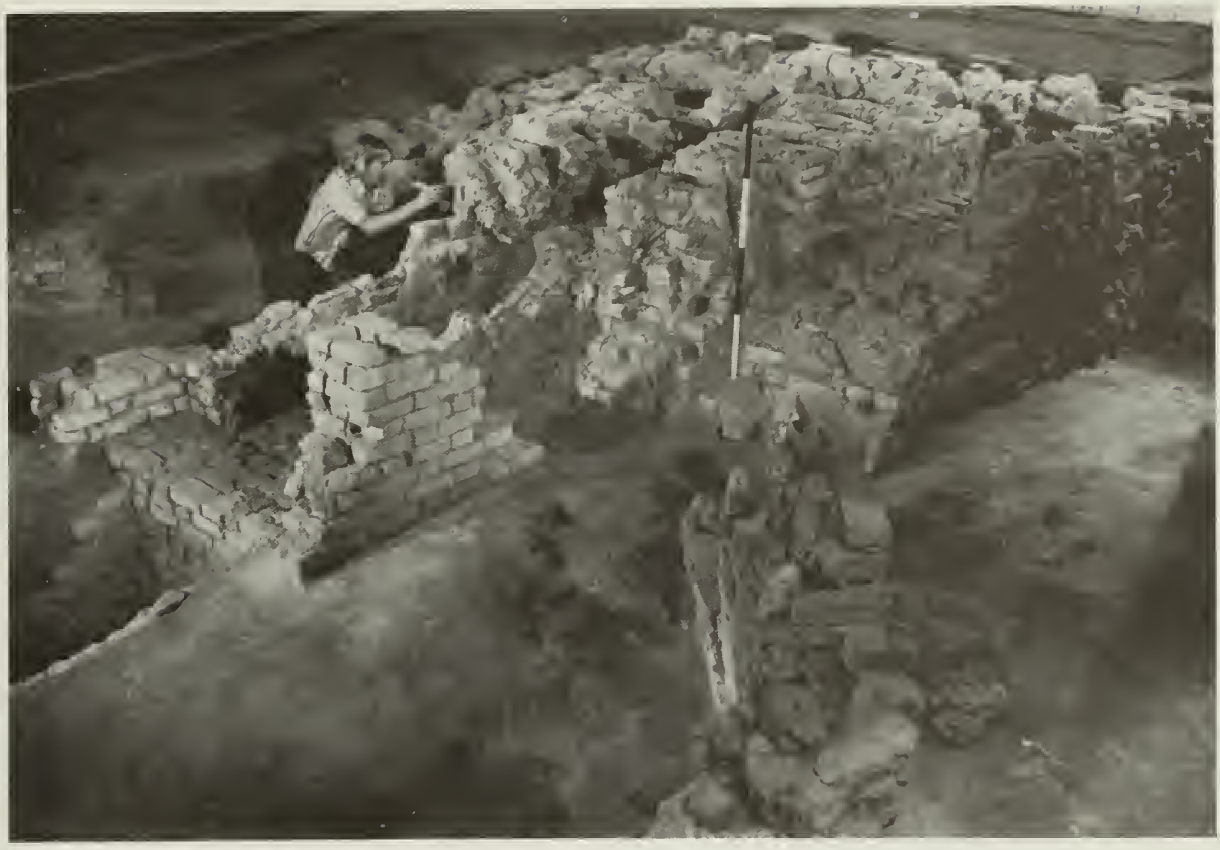


Figure 26. Large Kiln, looking southeast.

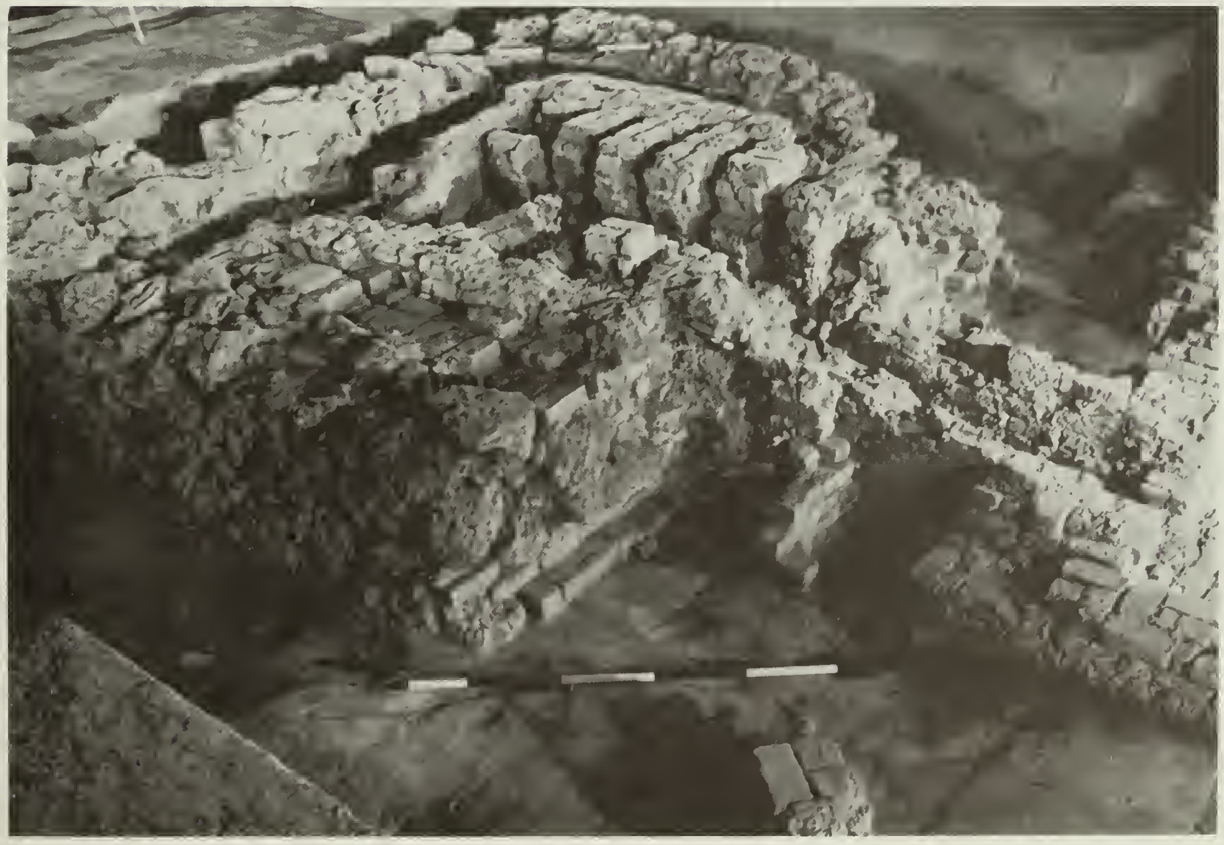


Figure 27. Large Kiln, looking southwest.

A similar stratigraphic situation extended over the platform-stoke hole pit area: 1). stratum 1, immediately over the bricks - a light brown soil containing similar artifacts - kiln furniture, as well as lenses of charcoal and ash; 2). a soft black stratum overlies stratum 1; 3). a layer of red brick rubble; 4). a layer of mostly yellow brick rubble extends above stratum 3. Strata 3 and 4 may represent demolition debris more or less in situ, as they reflect brick colors in the immediate vicinity.

The stoke hole pit contained many more strata below stratum 1 (brown). Within the vertical and horizontal limits of the stoke hole pit, 19 recognizable strata could be observed - rubble, sands of different colors, charcoal and ash lenses (Figure 36). The vertical thickness of the fill was 3.5 ft., extending some 0.9 ft. below the lowest brick. As explained before, this situation is due to gradual removal of subsoil by potters shoveling out ash debris from the stoke hole pit. Various layers contained mortar fragments, brick bats (glazed and unglazed), pottery, pads and props, as well as fused globs of salt glaze.

Marl Walls and Corridor

The flue-arch-vent area, made entirely of brick, is flanked on three sides (west, east, and south) by a continuous marl wall. (Figures 20-30). This straight-sided wall is built of irregular blocks of marl, the largest measuring two feet square. The wall survives to a height of 3.47 ft. and varies in width from 1.5 ft. to 2.5 ft. The east and west walls measure 10.4 ft. in length and the south wall is 13.3 ft. long. The north ends of the west and east marl walls terminate at a post-kiln disturbance, the meaning of which will be discussed toward the end of the present chapter.

The marl wall had been built flush against subsoil, from within the excavated hole the kiln had been built into. No evidence of mortar is present, although clay or mud seems to have been packed between stones.

The function of the marl walls is not clear, except as

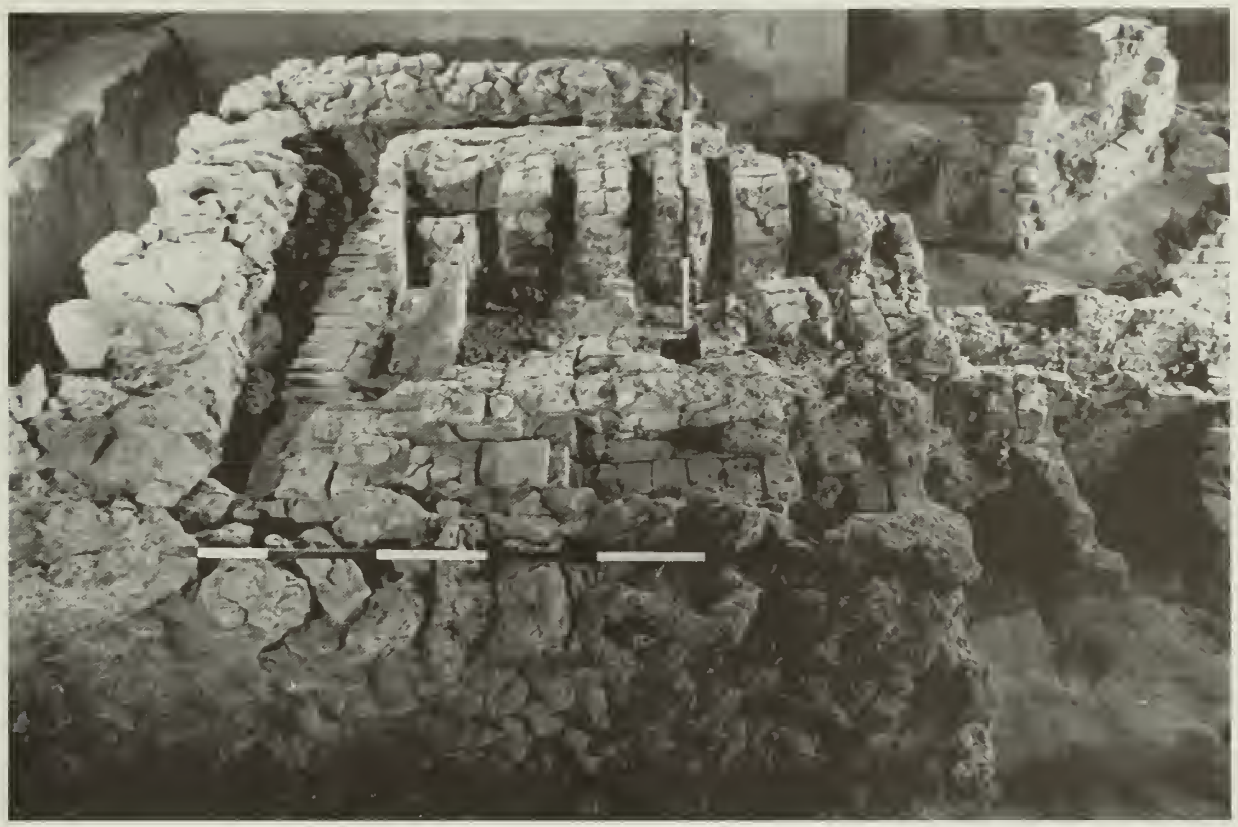


Figure 28. Large Kiln, looking west.

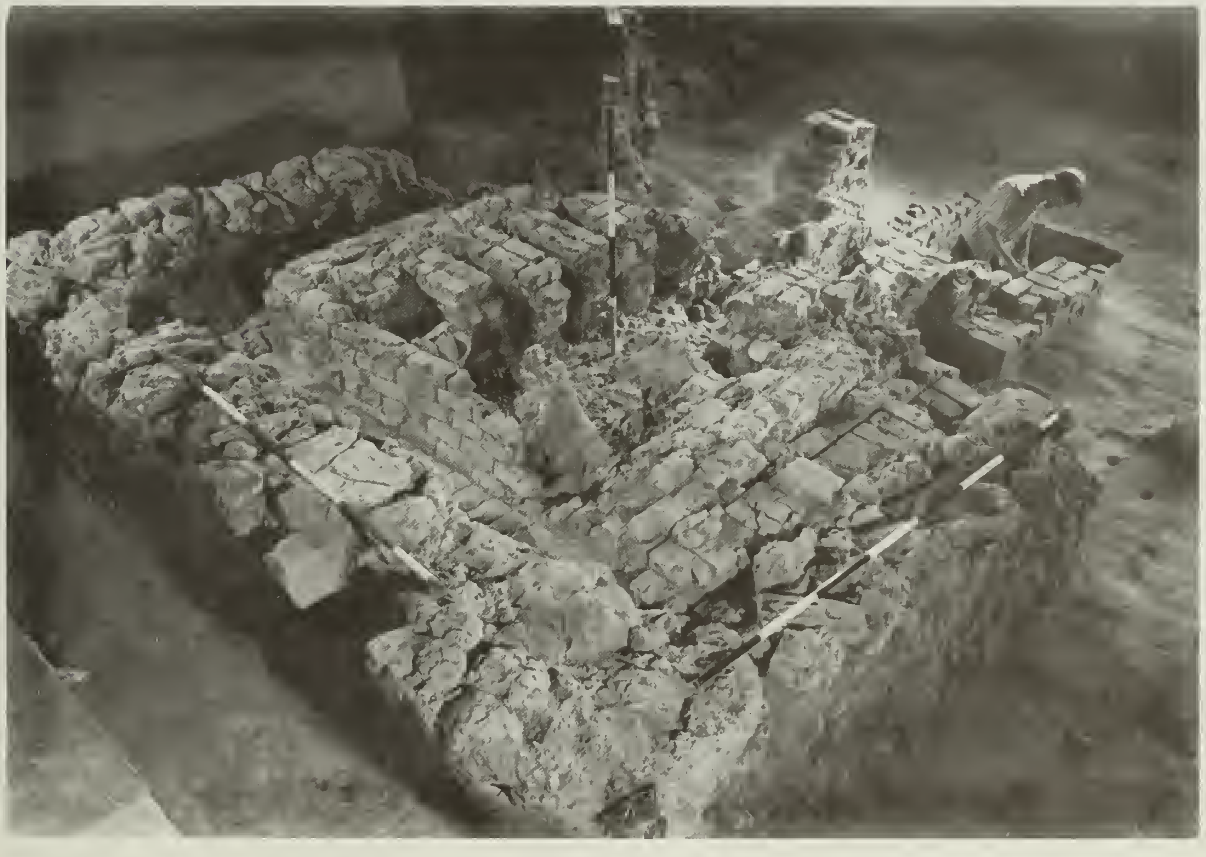


Figure 29. Large Kiln, looking northwest.

insulation between the heat chamber and ground. The marl blocks were almost certainly obtained along the nearby York River, and were probably a much cheaper building materials to use than brick. Nearby Grace Church (1697) was constructed entirely from marl blocks. The question as to whether or not the marl walls extended above ground level will be discussed later.

The lead glazed earthenware porringer, with initials A.C. and the date 1720 incised into it, was found just to the south of the south marl wall. The pot was found upside down within a very faint soil stain. The pot lay upside down with the handle toward the south. Within the pot was found dark brown soil, within which was a blue painted delft cup, broken from soil pressure. The cup lay on its side with the mouth to the west and the handle toward the kiln (Figures 247-253). The cup is of English origin, probably Bristol, and dates to c.1700. The porringer and cup burial probably represents a dedicatory rite possibly associated with the opening of the pottery factory.

Whereas on the south and east sides of the Large Kiln the marl walls directly articulate with the outer walls of the flue-arch-vent area, on the west side there is a definite gap. Separating the west marl wall from the brick flue-arch-vent area is a 'corridor' that measures 1.2 ft. in width and 8 ft. in length. The floor of this 'corridor' is c.1.5 ft. lower than the adjacent marl wall, and is also made of marl. The floor is actually made of uneven marl chunks. In order to make the floor smoother, the potters placed flat saggar lids, saggar bases, and body fragments on portions of this floor. It is probable that this 'corridor' functioned as a walkway along the west side of the kiln. From this walkway the potter would be in a position to observe, through peep holes or openings in the pot chamber, the state of the pottery being fired. The question of the very narrow walkway functioning as a 'corridor' will be discussed in a subsequent chapter.

The fill in the 'corridor' consisted of a light brown layer 0.2 ft. thick, which contained charcoal specks and occasional brickbats, and an upper red rubble layer.

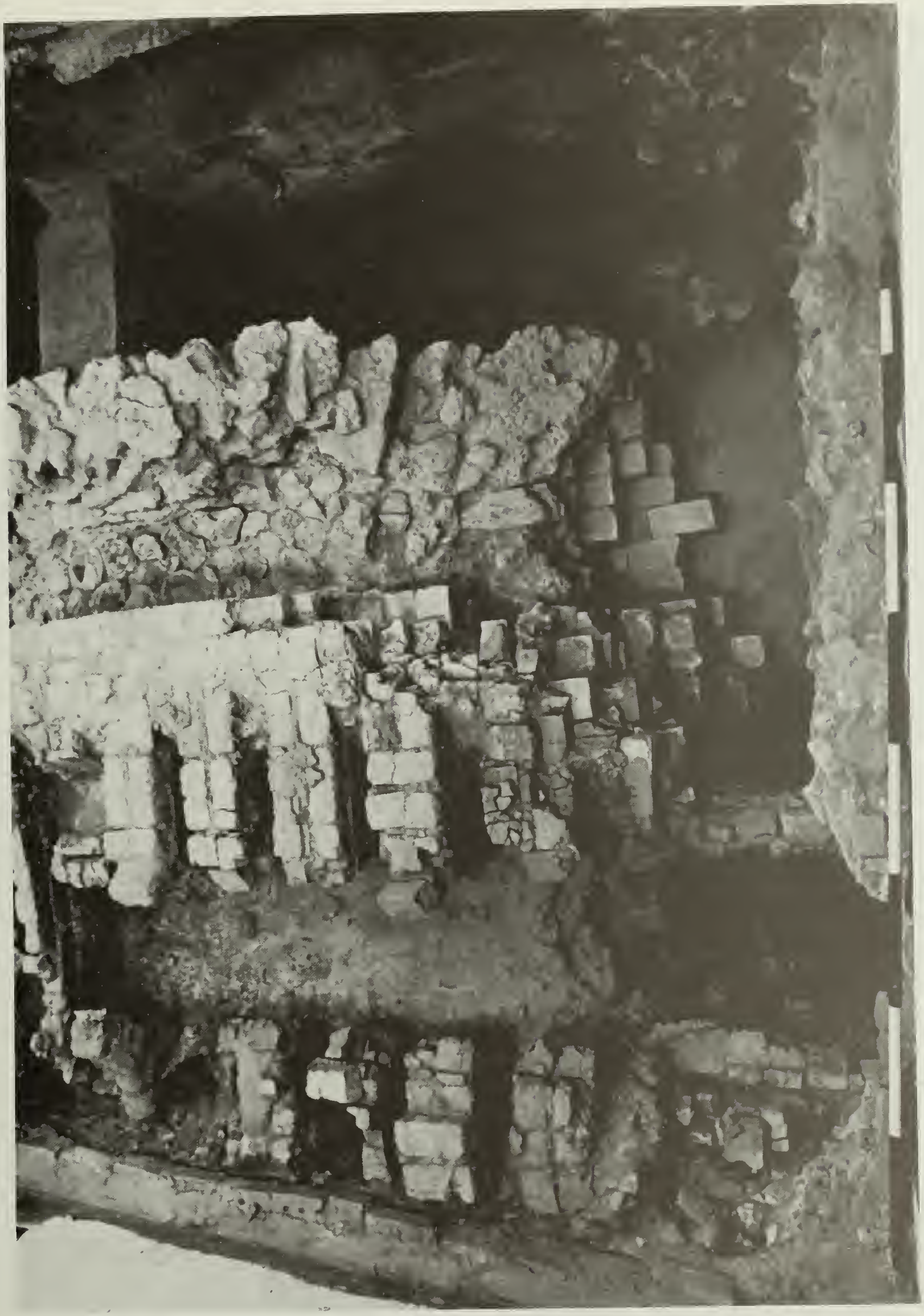


Figure 30. Plan view of arch and corridor area, Large Kiln. Looking south. Photo taken prior to removal of modern garage.

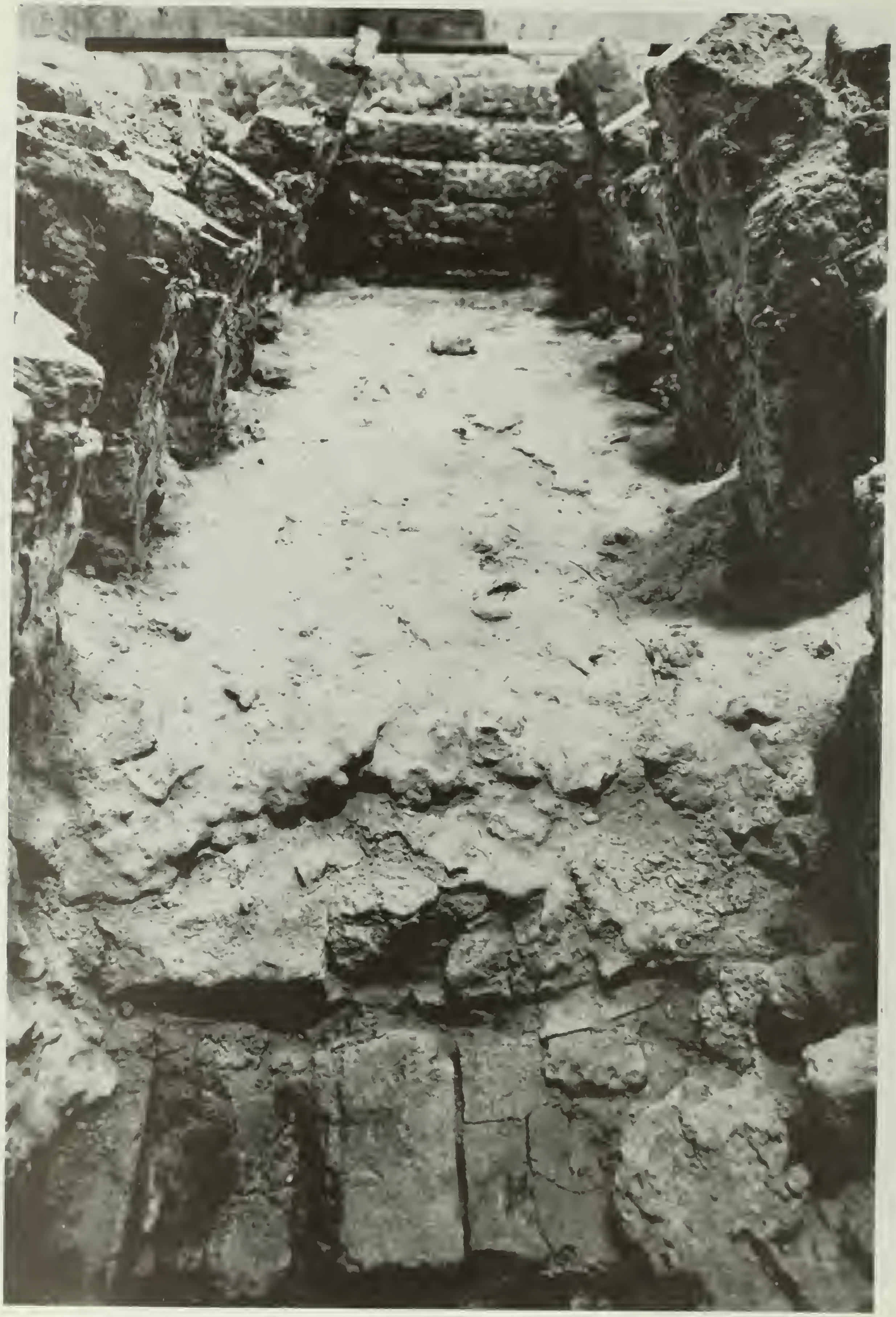


Figure 31. The main flue and arch area, Large Kiln. Looking south.

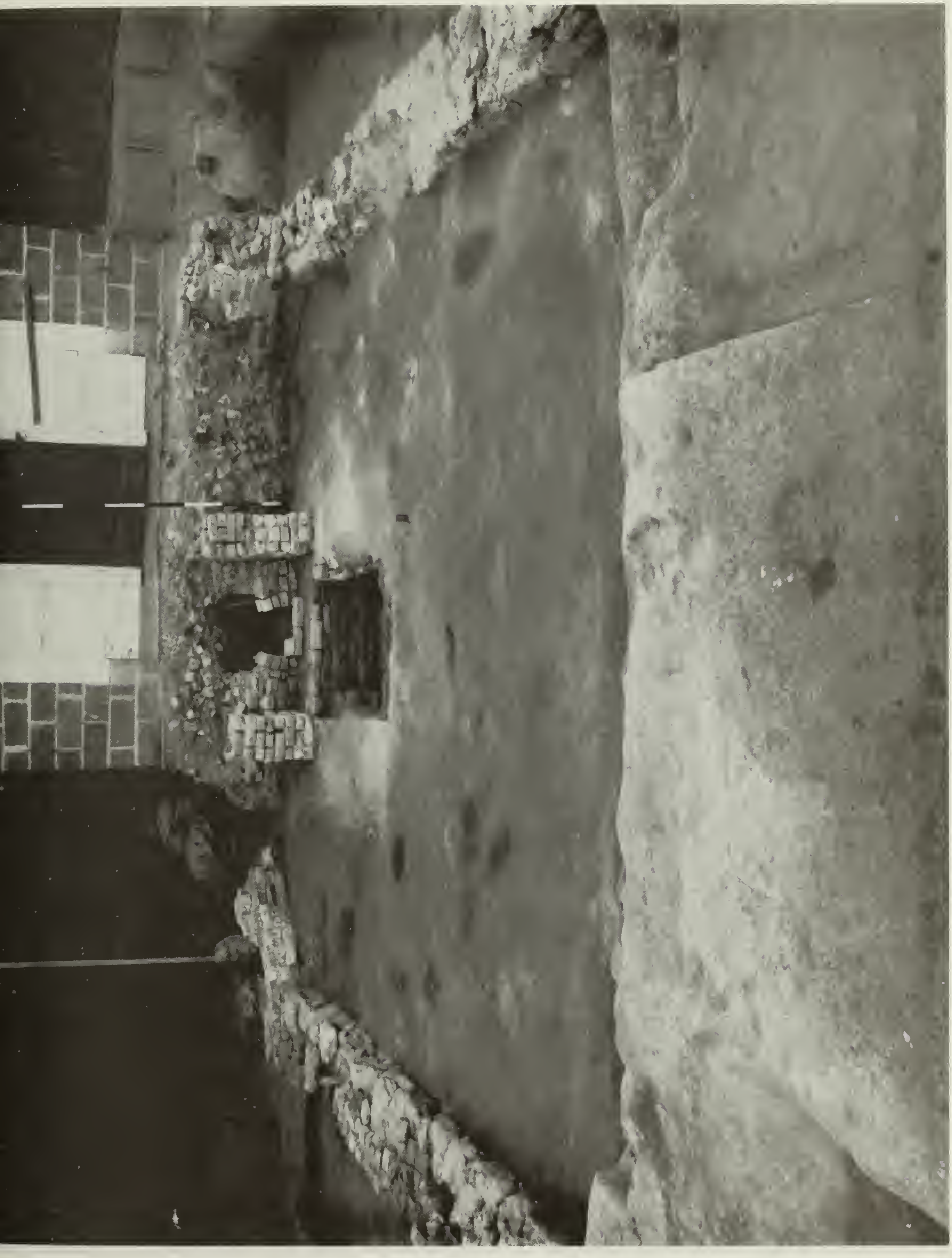


Figure 32. Fire box and stoke hole pit prior to removal of modern garage. Workshop room (center) with portions of Structure 2 in lower one-third of photo. Looking south.

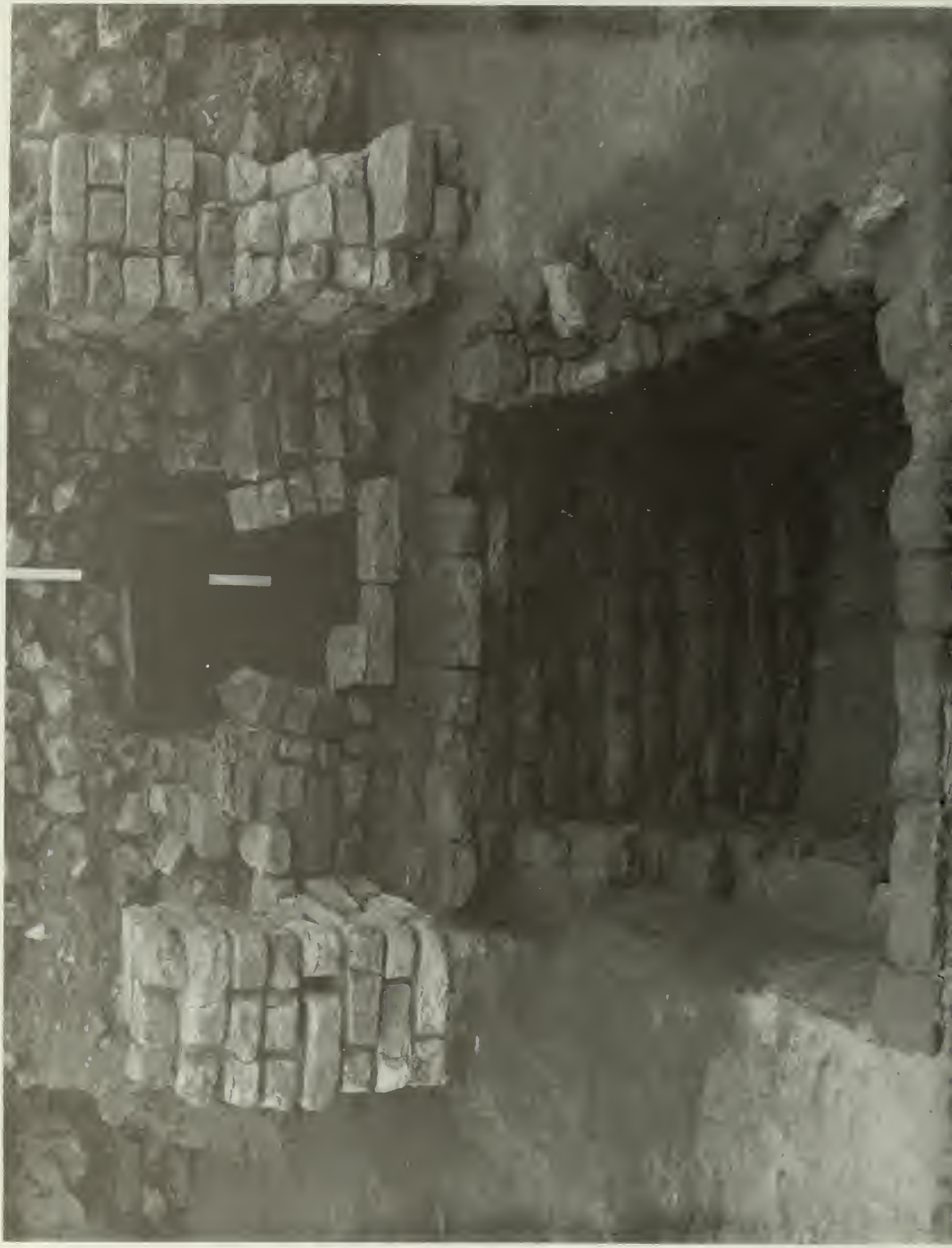
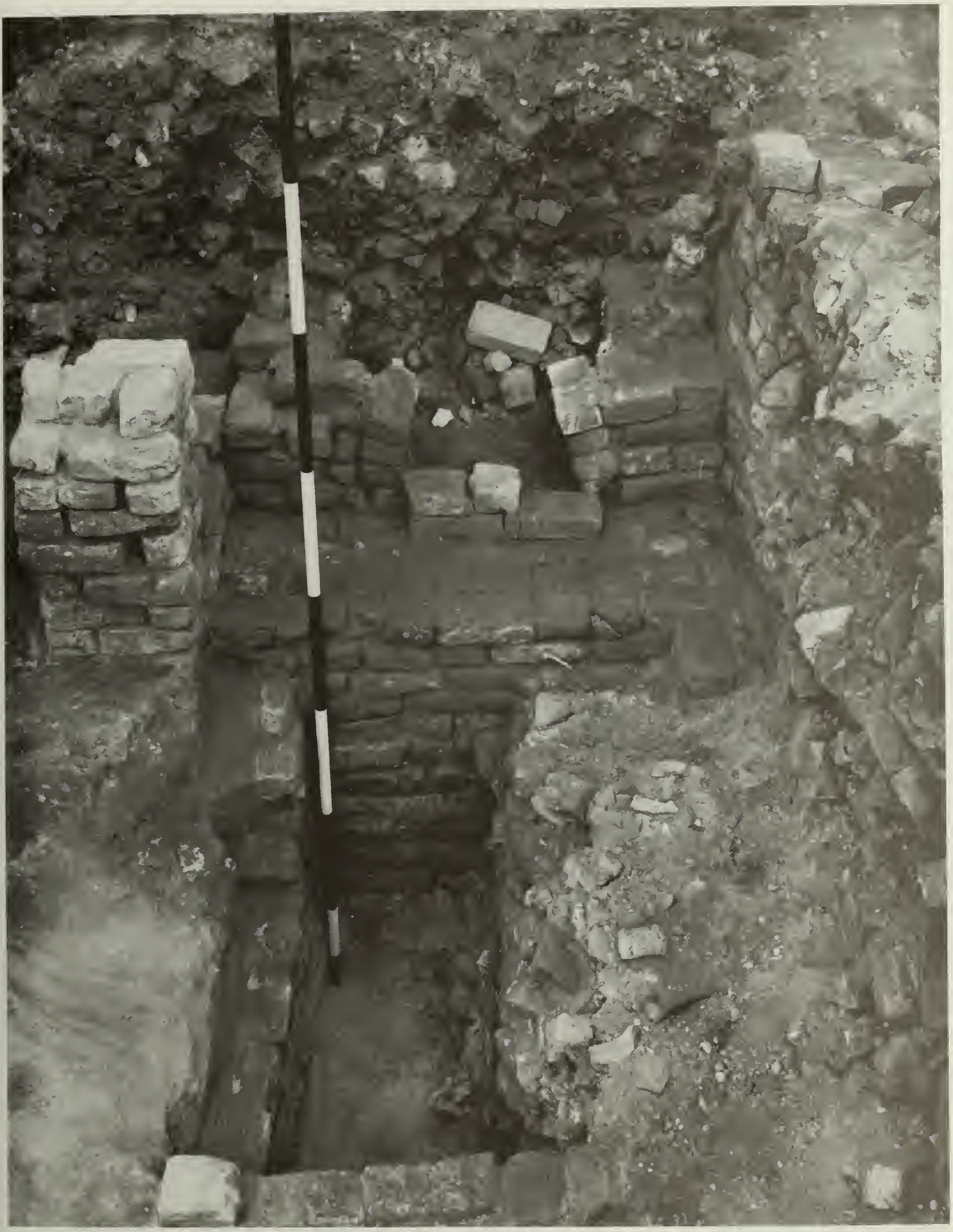


Figure 33. Firebox, retaining walls, and stoke hole pit, Large Kiln. Looking south.



igure 34. Firebox and stoke hole pit, Large Kiln, partially excavated. Looking south.

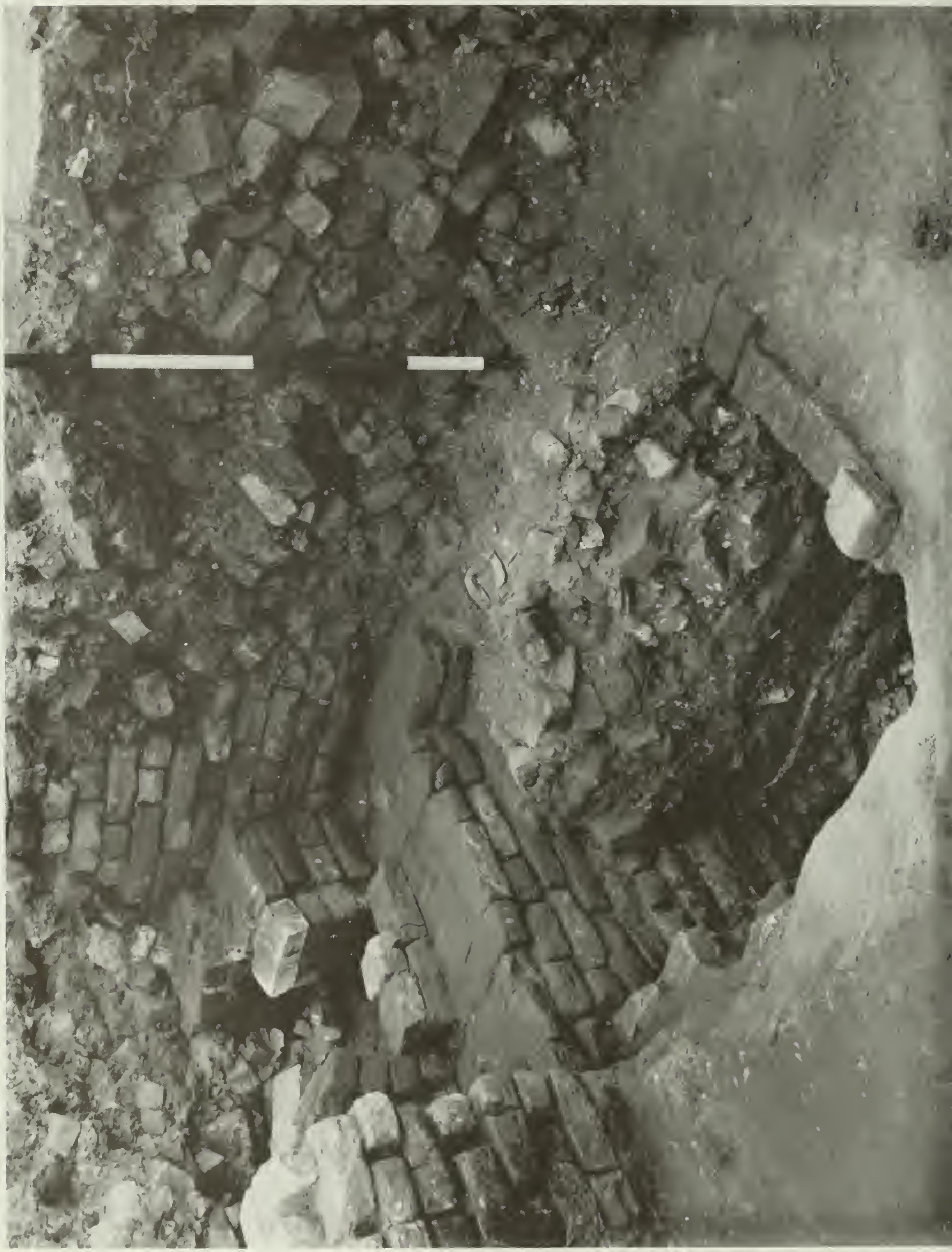
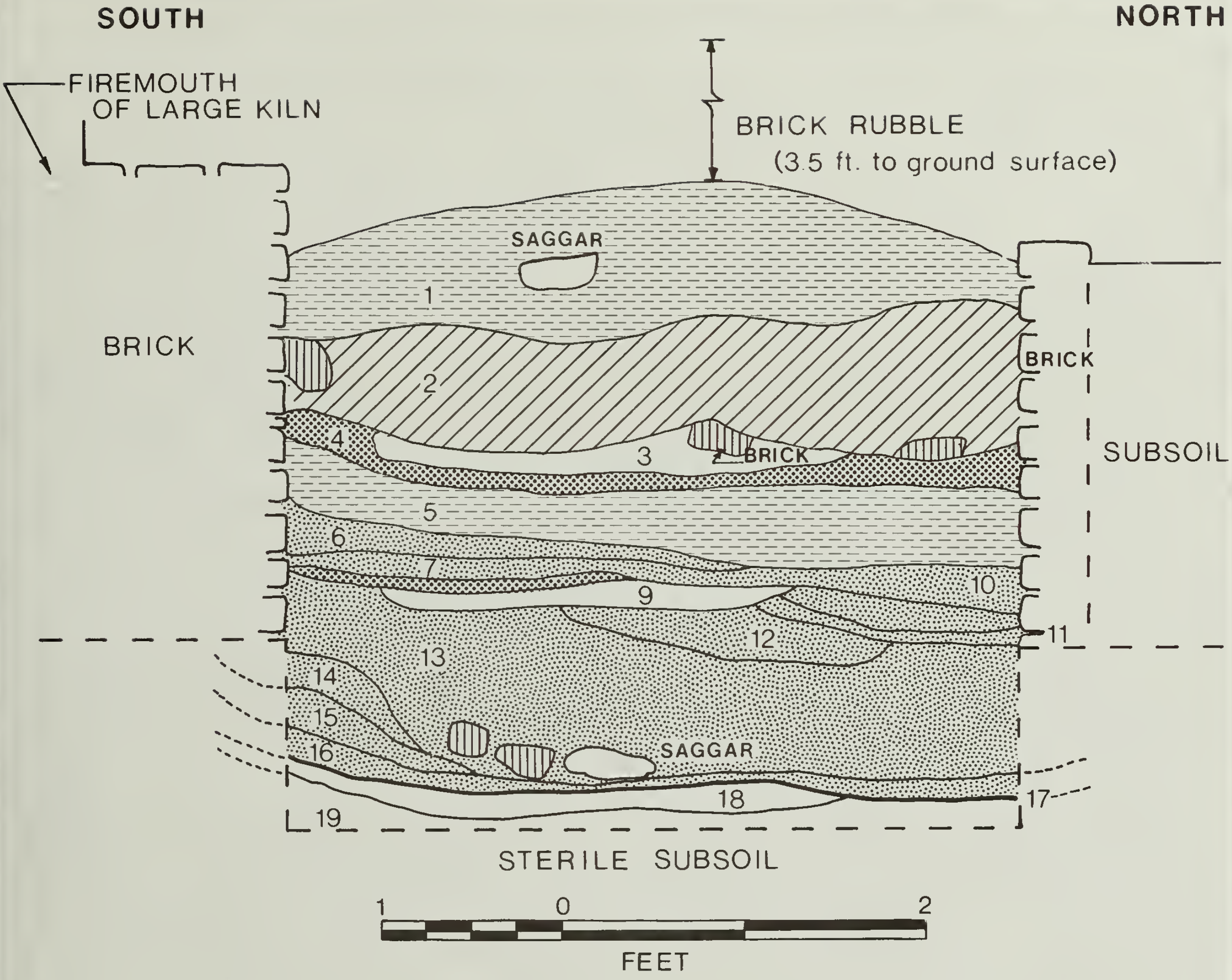


Figure 35. Stratigraphy, firebox and stoke hole pit area, Large Kiln. Looking southwest.



1. BRICK RUBBLE WITH RED-BROWN SOIL
2. YELLOW-BROWN WITH MORTAR FRAGMENTS
3. YELLOW SAND
4. CHARCOAL
5. RED BRICK DUST AND RUBBLE
6. BROWN ASH
7. WHITE ASH
8. CHARCOAL
9. BROWN SOIL WITH RUBBLE
10. DARK BROWN ASH
11. GREENISH BROWN ASH
12. BROWN MOTTLED ASH
13. LIGHT BROWN ASH WITH SAGGARS, PADS, ETC.
14. LIGHT BROWN ASH
15. PINK ASH
16. WHITE ASH
17. CHARCOAL
18. ORANGE SAND
19. LIGHT YELLOW SAND [STERILE]

STOKE HOLE, LARGE KILN
NORTH-SOUTH SECTIONAL VIEW

FIGURE 36

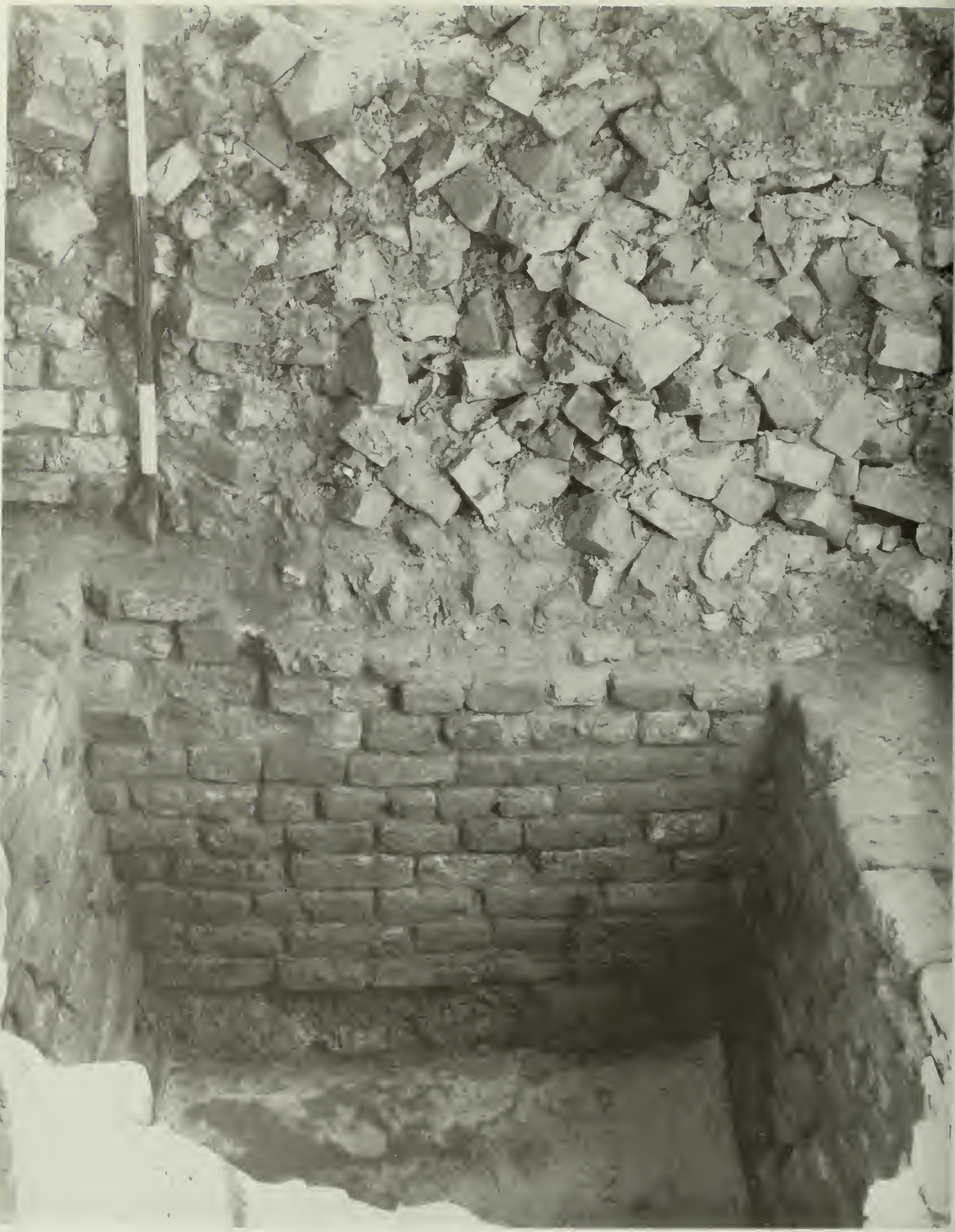


Figure 37. Excavated stoke hole pit with rubble above, Large Kiln. Looking west.

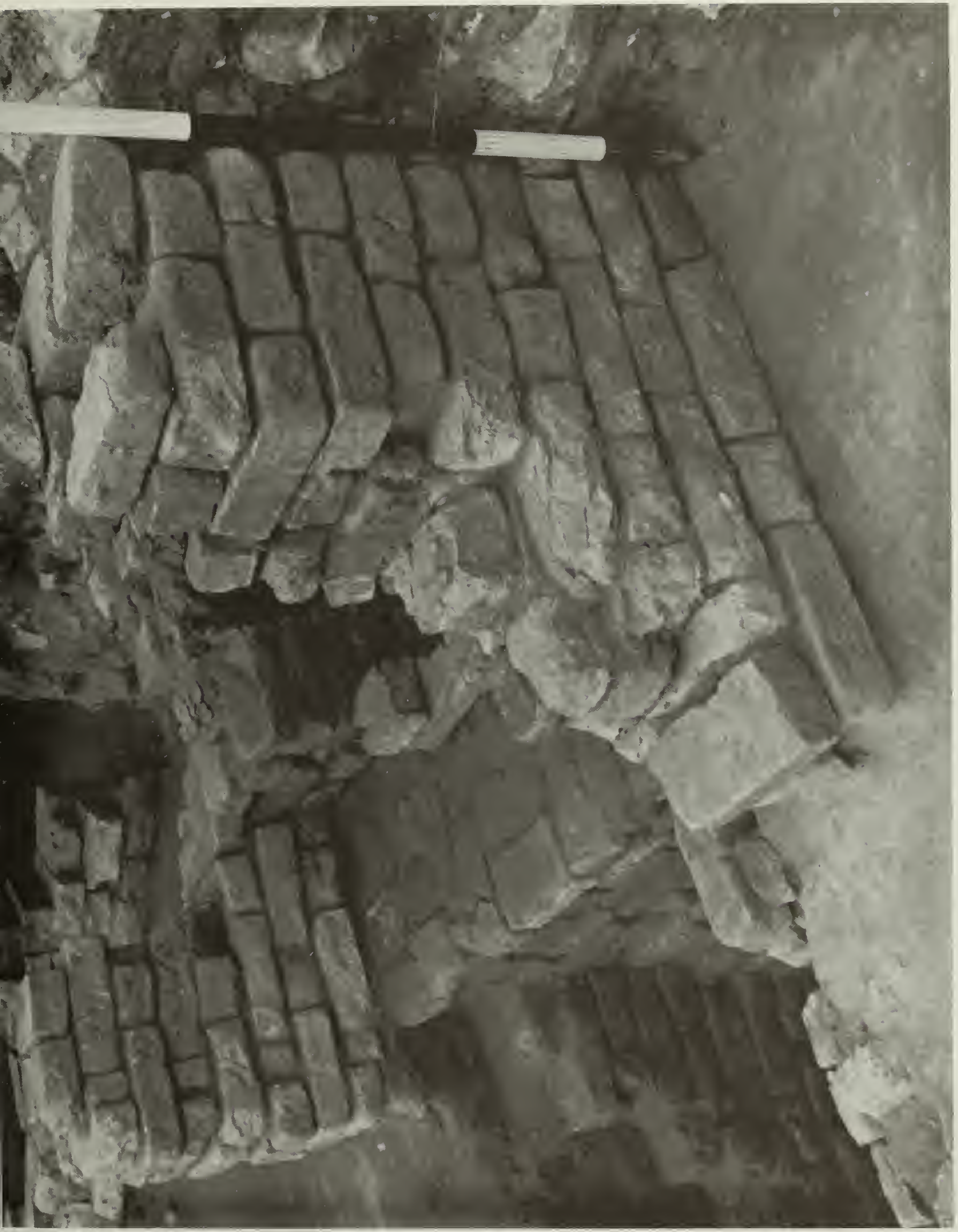


Figure 38. Retaining walls and firebox area, Large Kiln. Looking southeast.

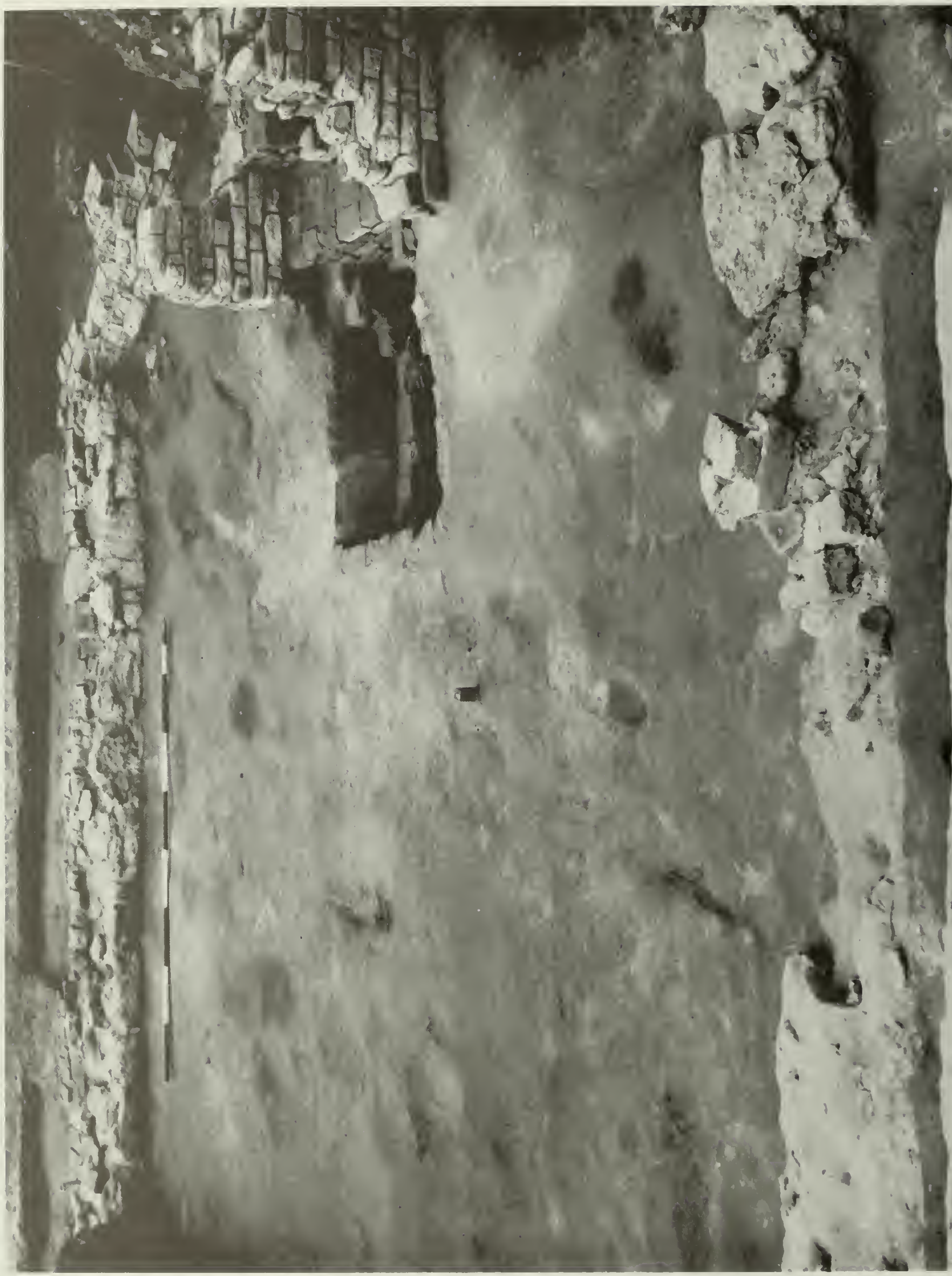


Figure 39. Structure 1, with stoke hole pit and firebox to right, Large Kiln. Looking east.

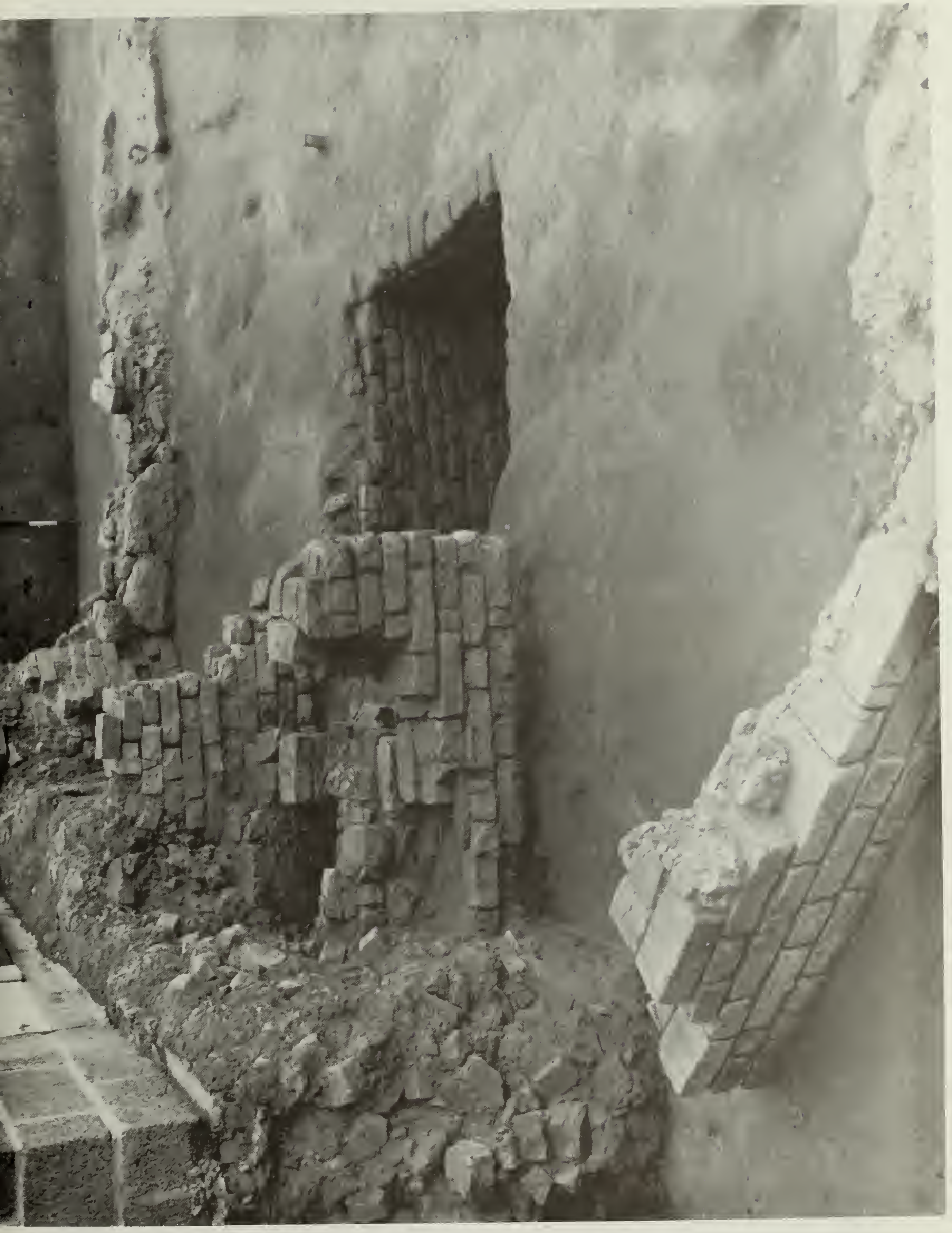


Figure 40. Large Kiln angling walls, firebox area, stoke hole pit, with Structure 1 to right. Looking west.

CHAPTER 6

THE SMALL KILN

The Small Kiln, situated 22.4 ft. to the south of the Large Kiln, is a smaller version of the latter, with some important differences. Whereas the Large Kiln has an extended firebox, the Small Kiln had a Bourry-like firebox. However, both kilns show identical features in their basic design. Both kilns were of the updraft type and each consisted of a lower heat chamber, constructed basically of surrounding brick walls and arch supports and arches which defined a main flue, and a pot chamber situated immediately above the heat chamber. Today only the lower heat chamber remains in both kilns, undoubtedly preserved by their underground position.

The exact temporal relationship between the Large and Small Kilns is not known. One can only say that a pottery kiln, probably the Large Kiln, was in operation prior to the operation of the Small Kiln. In other words, the Small Kiln was not the first kiln at the site, since Yorktown sherds were found in the builders trench of the Small Kiln. This significant information will be discussed in more detail later.

The remains of the Small Kiln measure 12.70 ft. by 5.75 ft. and consist of the lower heat chamber made entirely of brick, a stoke hole pit with earthen steps leading into it, and filled builders trenches. The kiln, like the Large Kiln, had been built into a hole dug three feet into subsoil or c.4-4.5 ft. from ground surface. The present archaeological remains are well-preserved to a maximum height of 2.9 ft. because of the kiln's subterranean construction. The uppermost surface of the kiln is presently on the same level as the subsoil surface. (Figures 41-93).

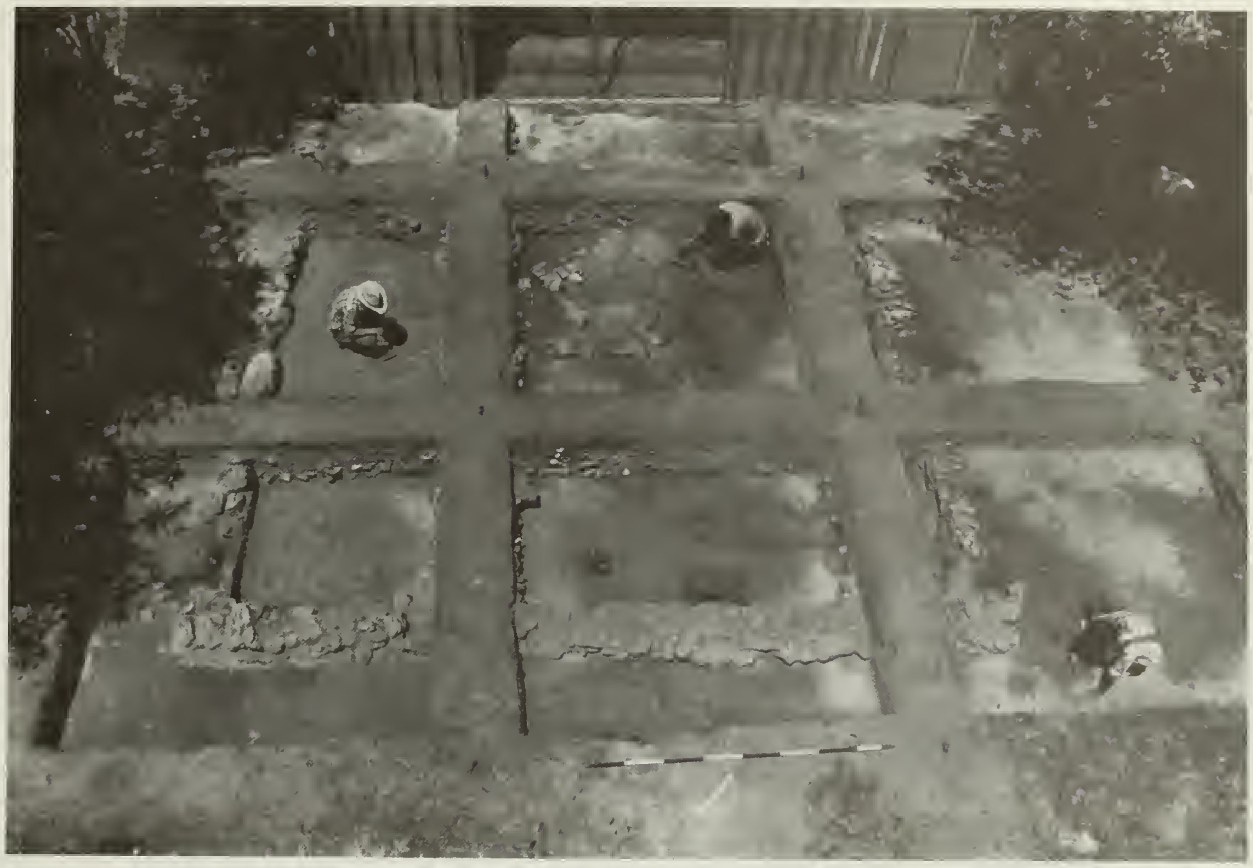


Figure 41. Small Kiln area, with excavation balks in place. Looking north.

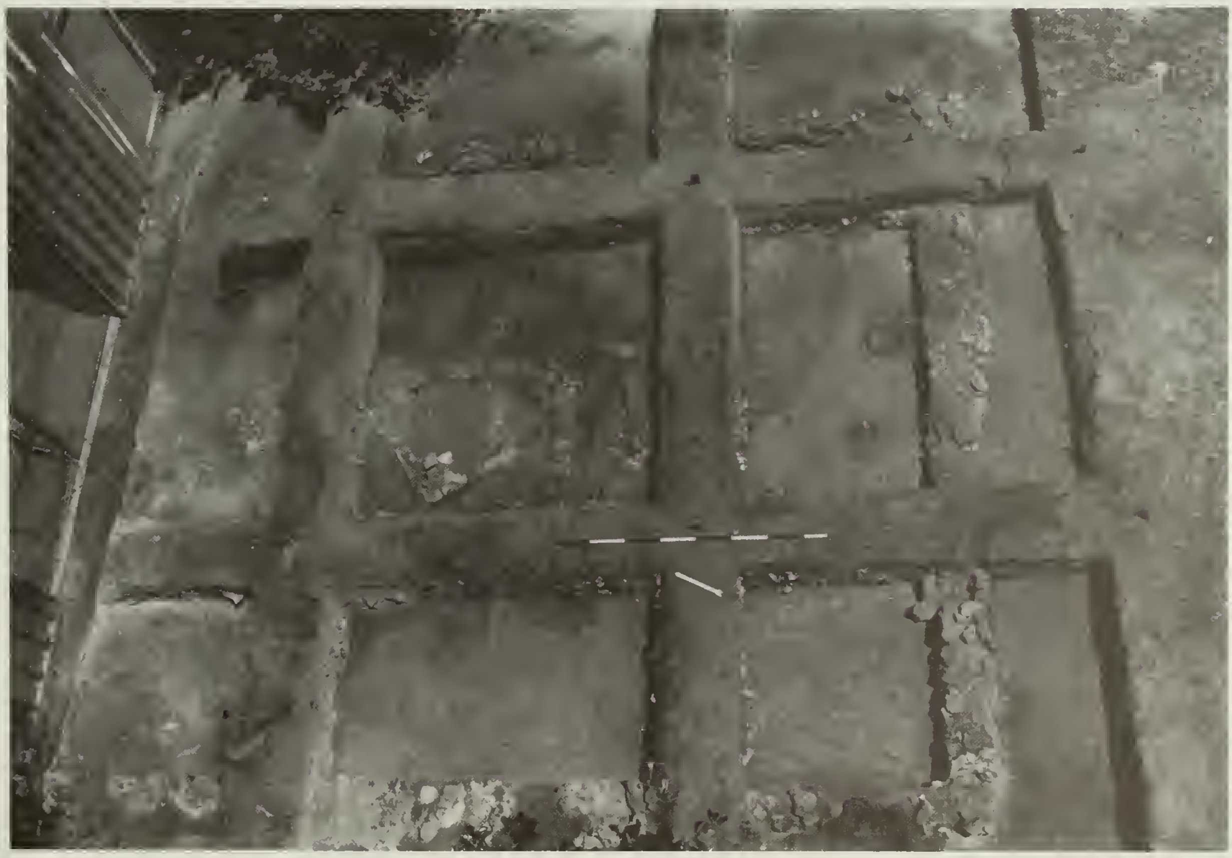


Figure 42. Small Kiln area, with excavation balks in place. Looking east.

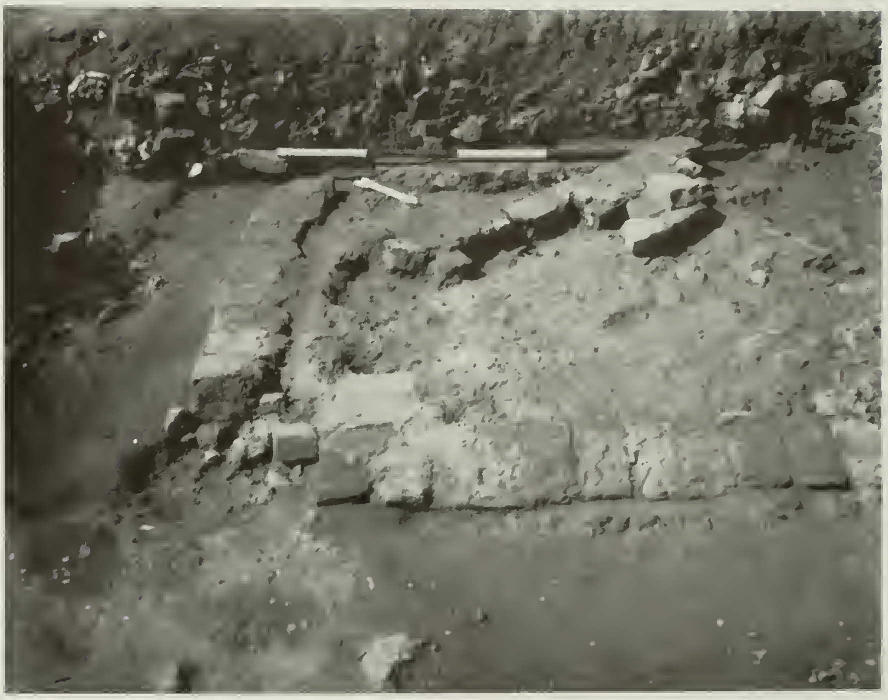


Figure 43. Small Kiln, closeup view of filled kiln at subsoil level. Looking west.

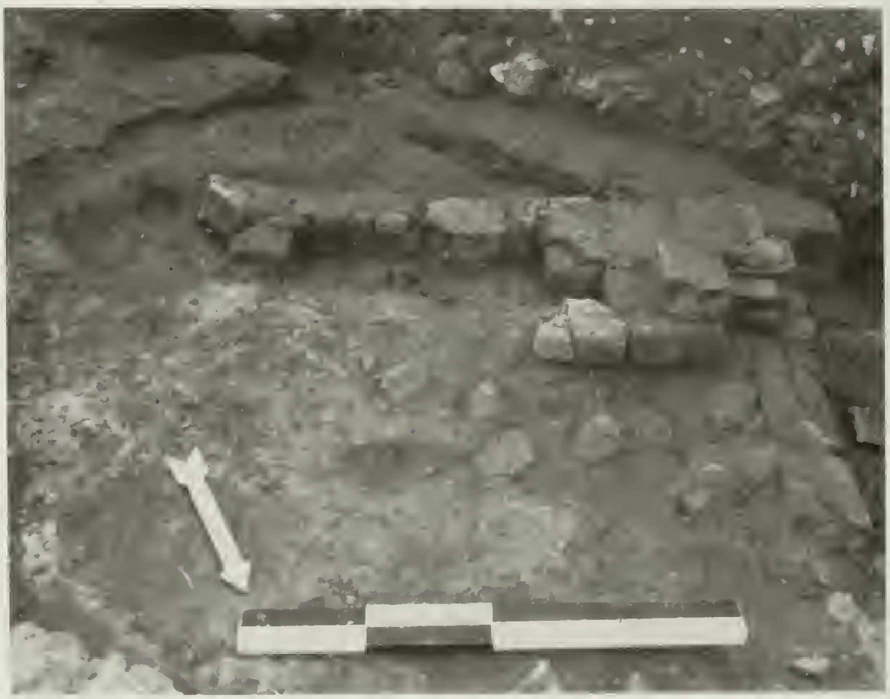


Figure 44. Small Kiln, closeup view of wall remains on surface of kiln fill. Looking southwest.

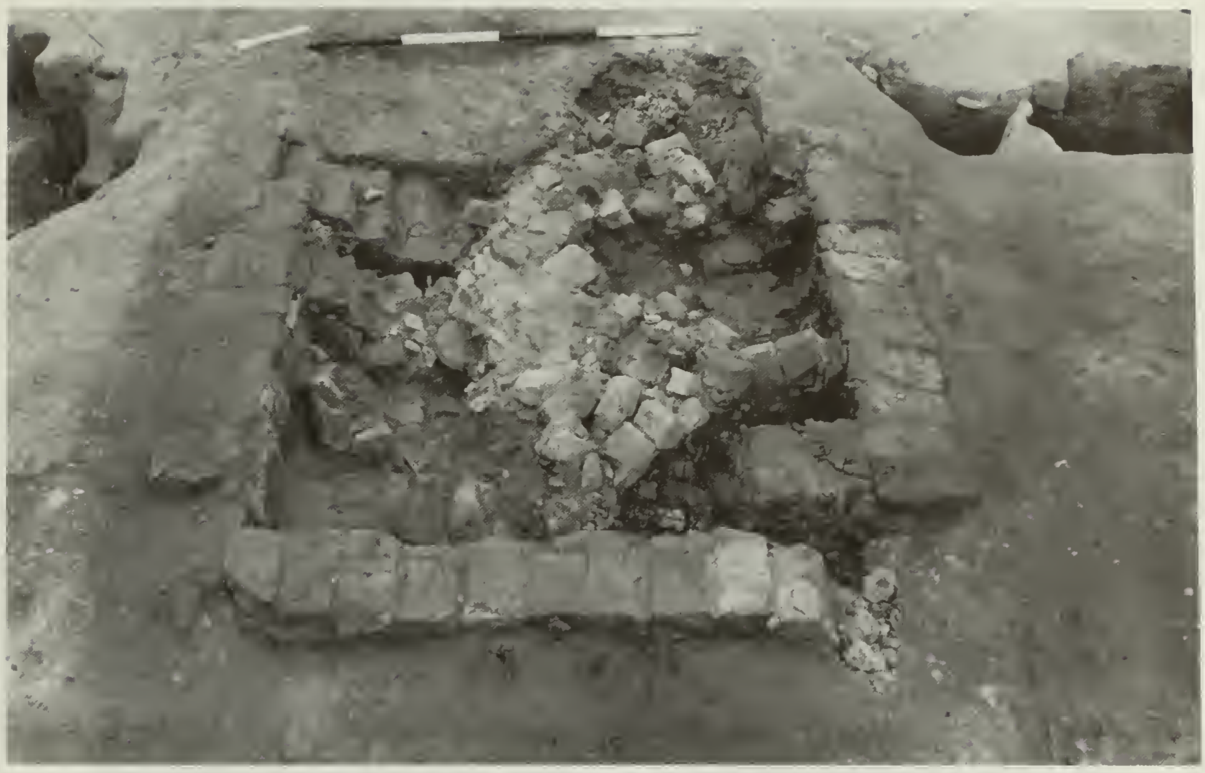


Figure 45. Small Kiln, surface of rubble fill. Looking north.

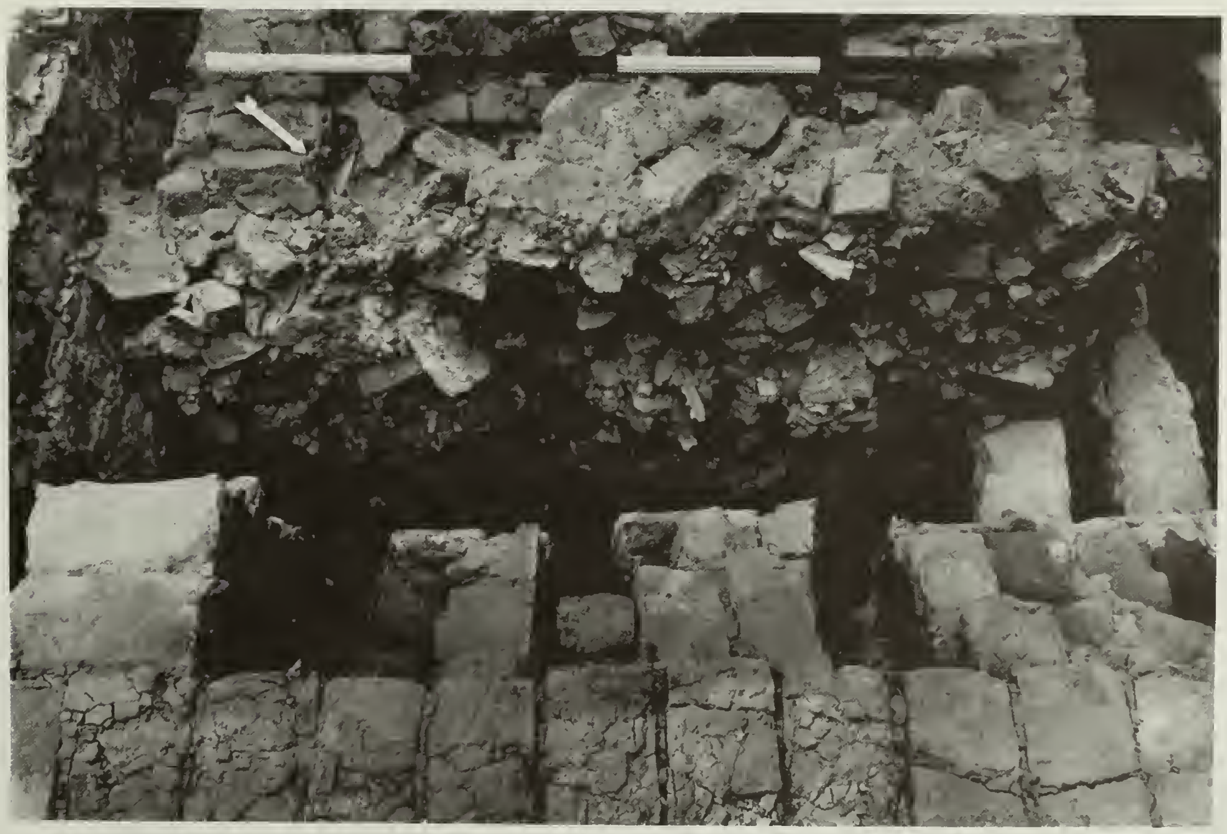


Figure 46. Small Kiln, rubble fill, interior of kiln. North-south section.

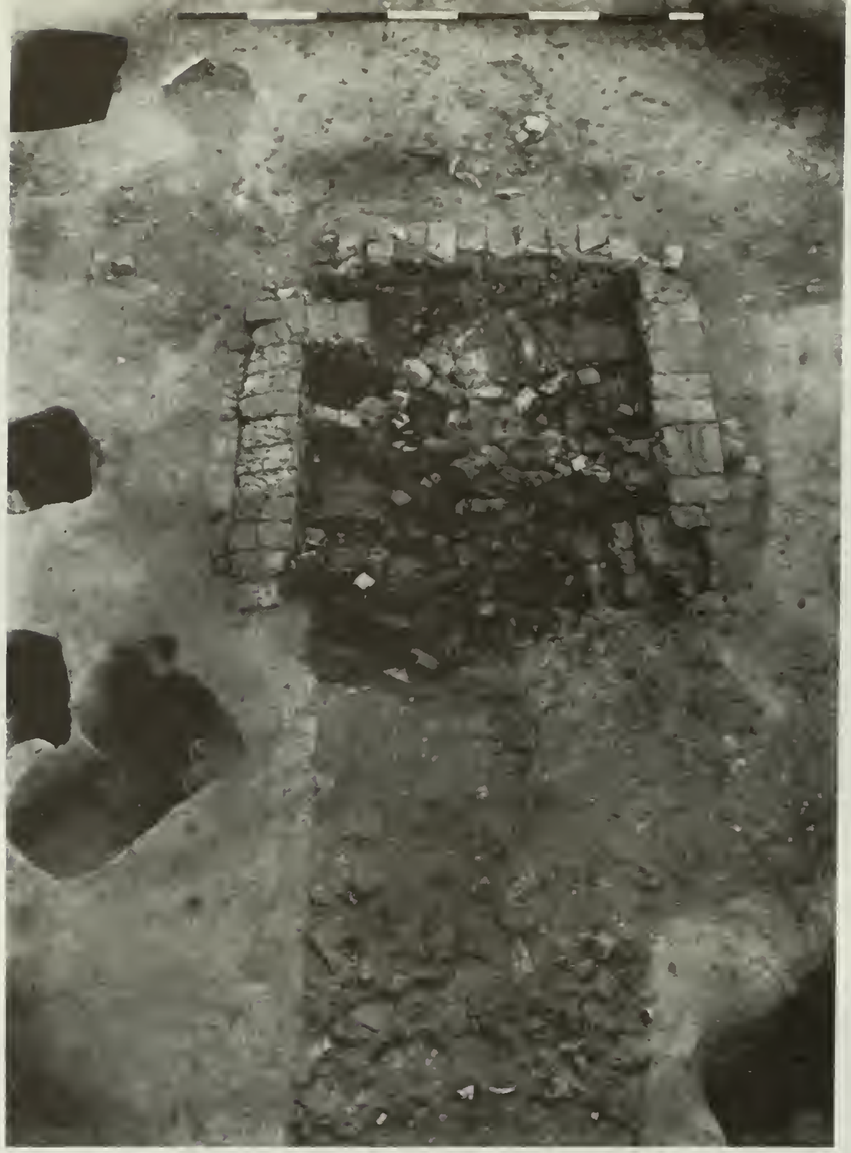


Figure 47. Small Kiln, rubble filled kiln and stoke hole pit. L. south.

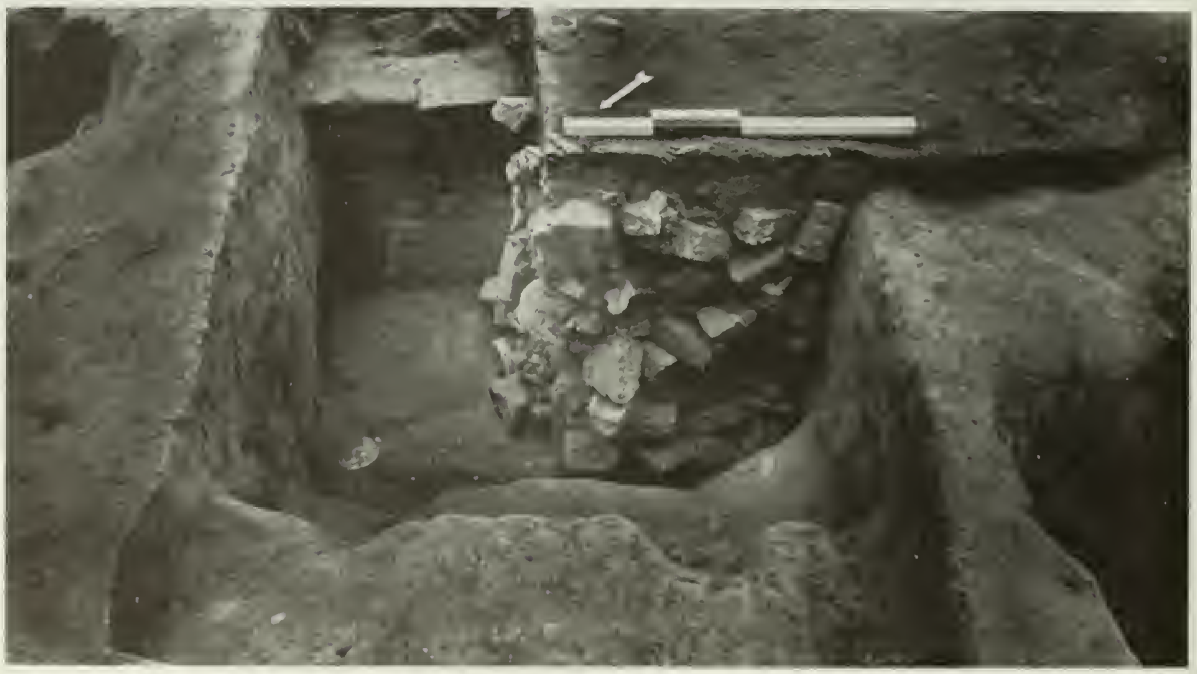
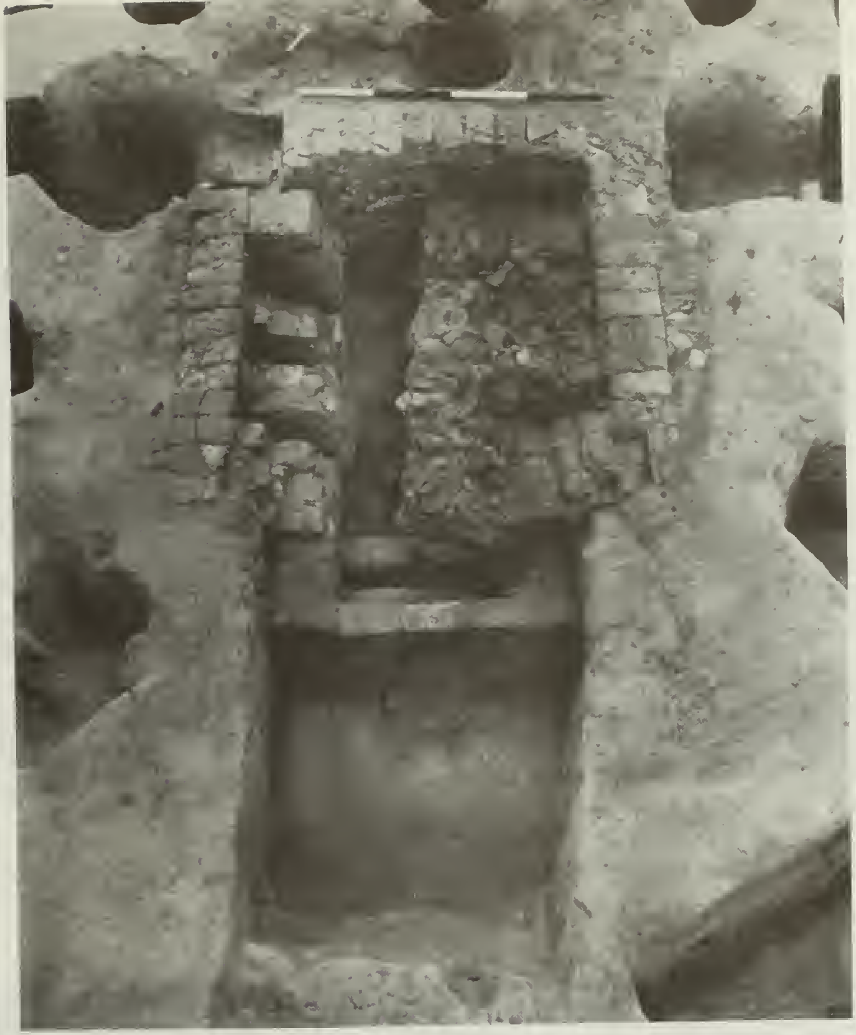


Figure 48. Small Kiln, section of rubble fill in stoke hole pit. Looking south.



igure 49. Small Kiln, section of rubble fill and excavated stoke hole Looking south.

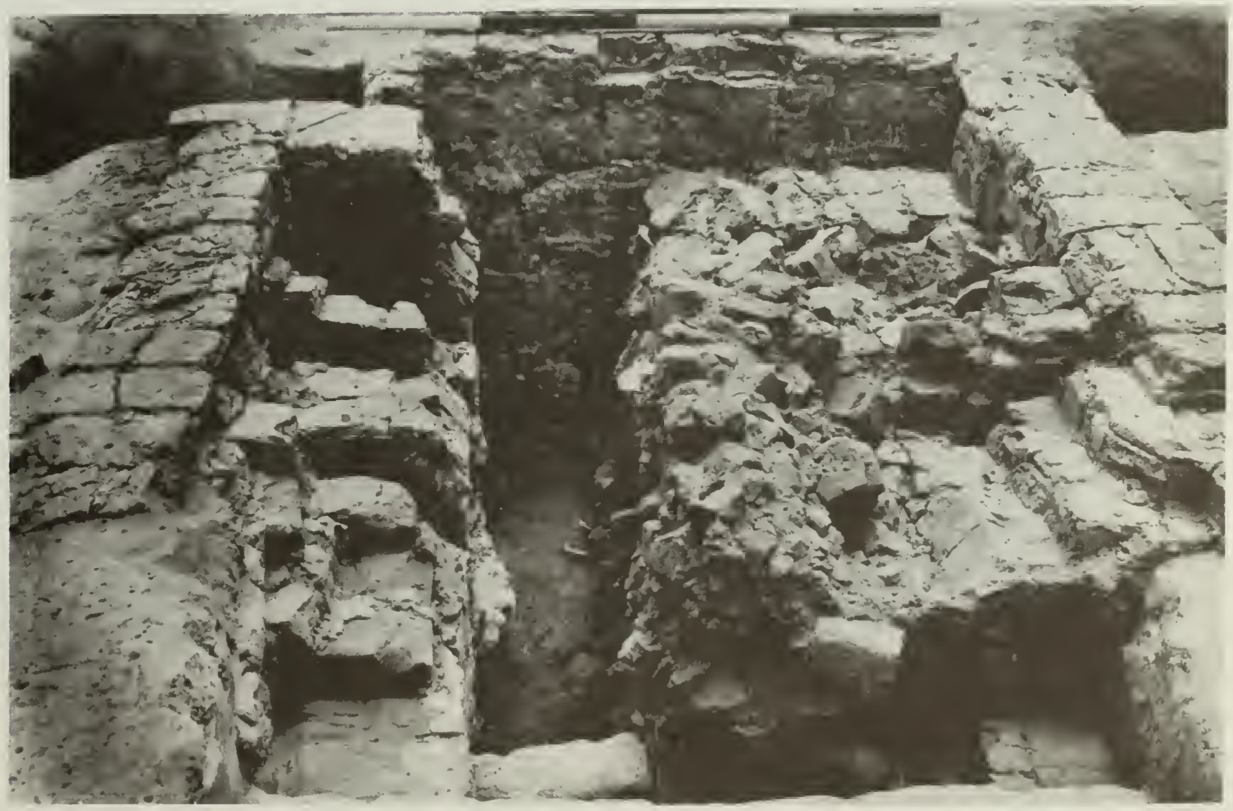


Figure 50. Small Kiln, closeup view of section, interior of kiln. Looking south.

Lower Heat Chamber-Firebox

The lower heat chamber is a nearly square (5.75 ft. by 5.6 ft.) brick box with a narrower projection of the north or stoke hole pit side. Overall, the chamber has maximum dimensions of 7.10 ft. (north-south) by 5.75 ft. The chamber consisted of outer brick walls, interior arch supports and arches designed to promote heat circulation through flues, and an interior firebox area.

The east, south, and west walls of the lower heat chamber are each one brick in width (8-8-1/2 inches) and presently reach a height of 12-13 courses (2.9 ft.). The north wall, containing a stoke hole, is only one-half brick wide. All bricks in the heat chamber were mortared (shell mortar) in place and are red, non-fire brick. Brick size usually approaches 8-1/2 x 4-1/4 x 2 inches. The southwest and southeast corners of the chamber were partially destroyed by posthole intrusions.

For the most part, the brickwork was laid in random bonding patterns. The east and west walls appear to be mostly headers with some stretchers. Some headers exhibit salt glazed ends on the exterior side of each wall, indicating re-use of kiln brick.

The south wall is more readily observable on its exterior surface, due to a wider builders trench adjacent to it. Coarses 1-7 contain numerous salt glaze headers. The most interesting thing about this wall is the presence of an arch in the middle of the wall between courses 7 and 12. The arch is partially obscured by a covering of mortar (shell mortar?) or clay-mud which had been placed over much of the exterior surface of the south wall. The arch springs from bricks in course 8. It reaches a maximum length of c.2 ft. and an interior height of 0.6 ft. The arch appears to have been constructed of regular brick with probable wedge-shaped mortar joints. On the interior side of the south wall, the individual bricks of the arch are difficult to discern due to a heavy coating of salt glaze. However, the complete arch was of the same nearly semi-circular shape as the other four arches within the heat chamber. Whereas the other four arches served to define

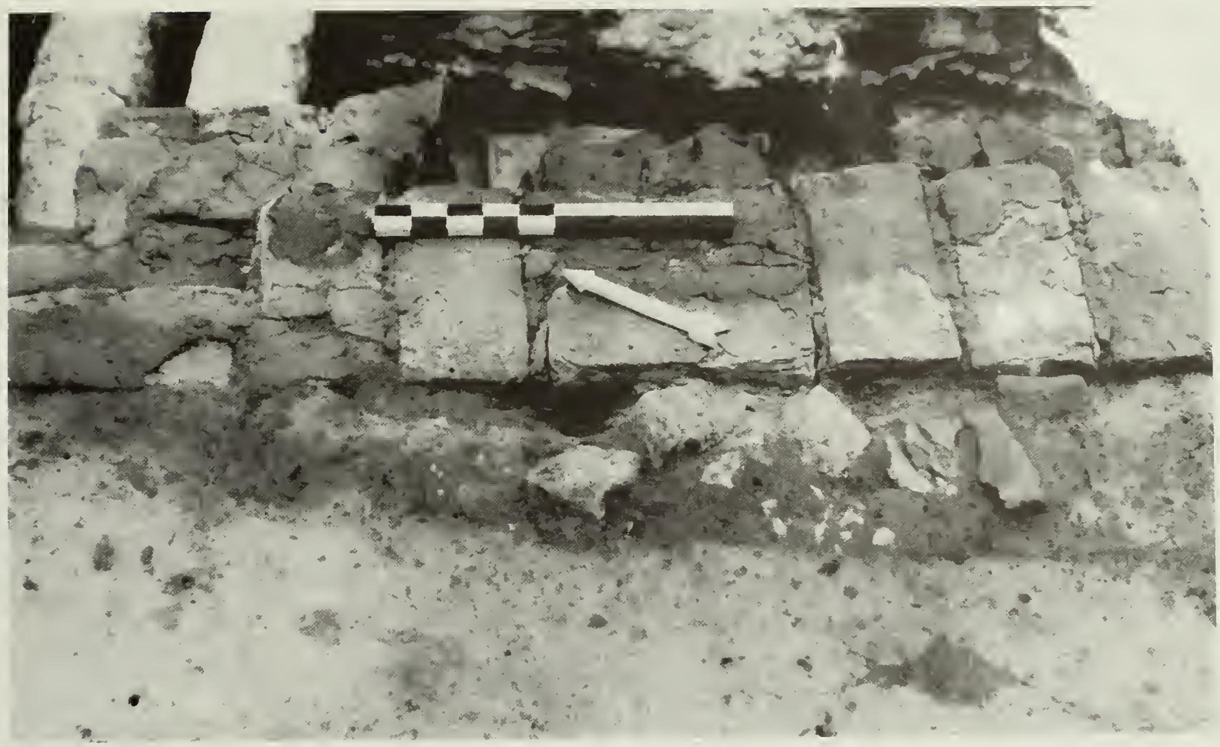


Figure 51. Small Kiln, filled builders trench, west side of kiln. Looking east.

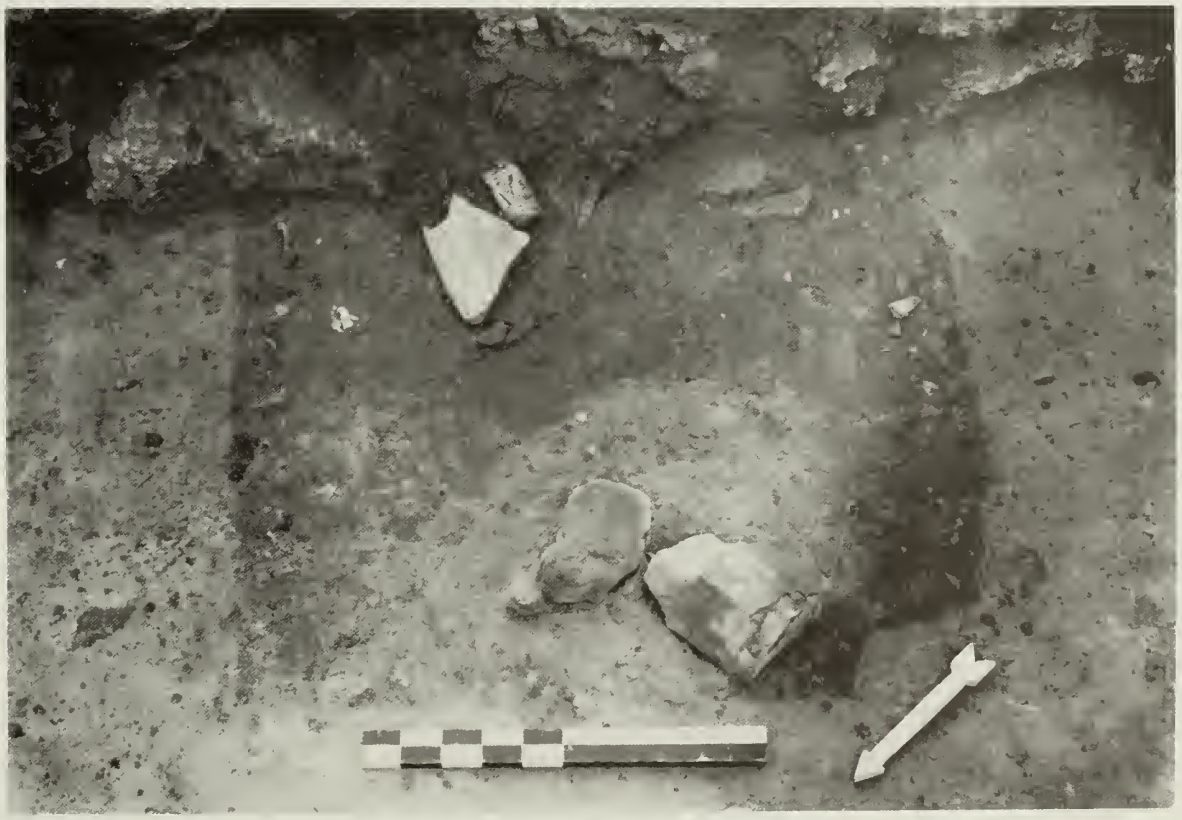


Figure 52. Small Kiln, plan view of filled posthole #16, with marl wall at top. Looking south.

the main flue and also to support the pot chamber floor, the arch in the south wall was undoubtedly built in order to strengthen the rear wall of the kiln.

The bricks of the rear wall of the Small Kiln are keyed into the east and west walls in courses 1-7. Courses 8-10 of the west end of the rear wall seem to abutt the brick of the west wall. This evidence seems to indicate that the arch was of later construction than courses 1-7. Also, some arch brick appear to be reused bricks. However, courses 1-7 had also been rebuilt prior to arch construction, as indicated by the presence of salt glazed bricks visible on the wall exterior.

The north wall of the Small Kiln is shorter and narrower than the previously described walls, due to its different function as a firebox and stoke hole wall. The north wall is situated 1 ft. north of arch 1 (and the northern terminus of the east and west walls), abutting two brick pilasters (each 1 brick wide) that flank each side of the main flue. The wall is the same length as the distance formed by the brick pilasters and main flue.

As Figures 78 and 79 show, the north wall was rather curiously constructed. Courses 1-7 are not bonded but are instead divided into three separate parts horizontally: the one-brick wide pilasters at the west and east ends and a central section which forms the 0.9 ft. high stoke hole. Course 8, made of six whole or half bricks, does not reflect this tripartite division.

As found archaeologically, the stoke hole was plugged with a slab of clay on its exterior side. In turn, the interior portion of the stoke hole had been plugged with 8 brickbats.

The interior fo the area formed by the previously described four outer walls contained four arch supports and flue arches, four minor flues, a main flue, and two lower arches which formed the firebox area. Since the entire interior of the kiln was heavily salt glazed, it is difficult to discern individual brick and bonding patterns.

A main flue is 2.0 ft. wide and extends from the north wall to the south wall, a distance of 5.8 ft. No flooring bricks are

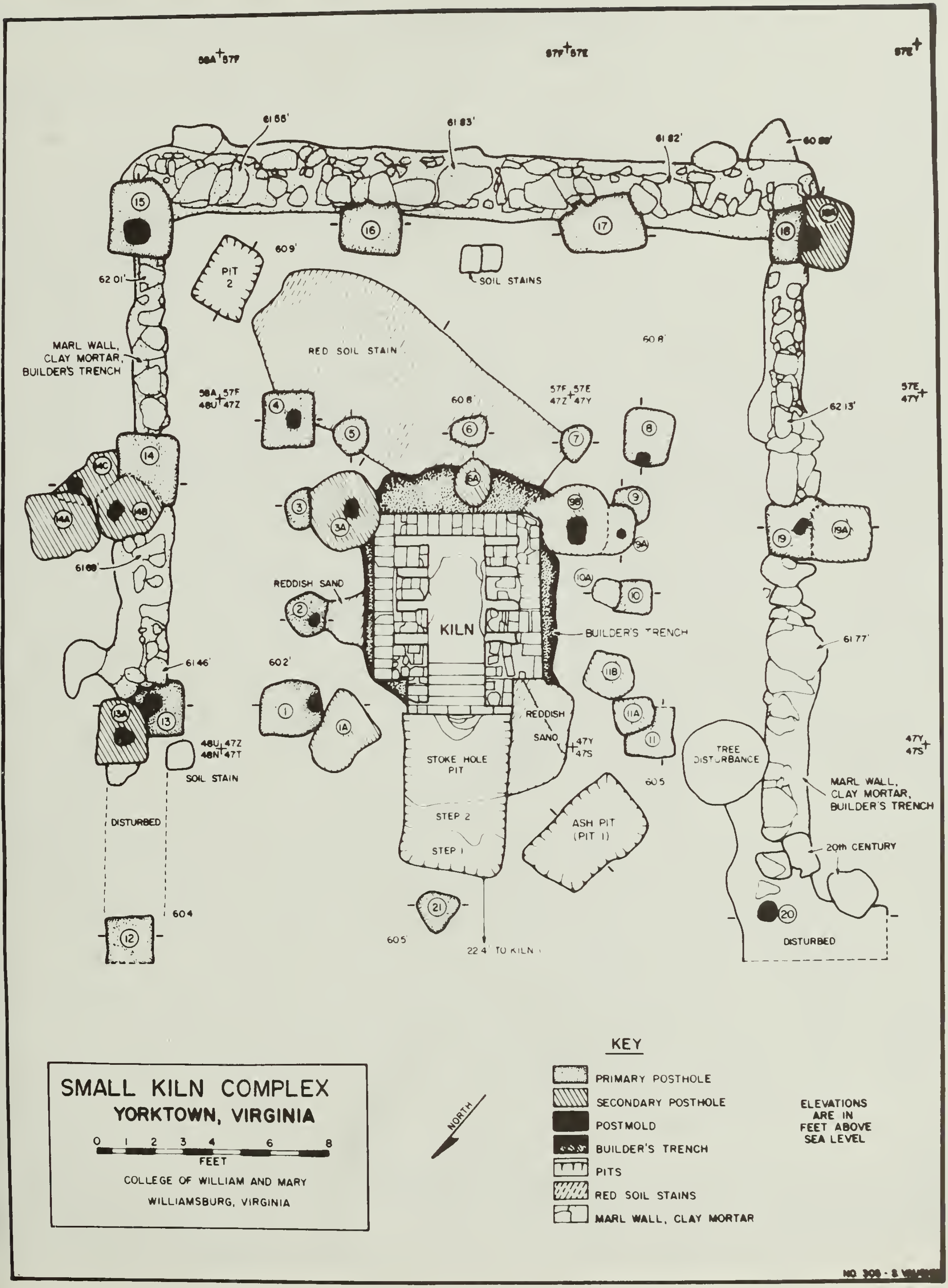

58A 57F
57F 57E
57E
61.66'
61.83'
61.82'
60.88'
15
16
17
18
60.9'
PIT 2
SOIL STAINS
62.01'
RED SOIL STAIN
60.8'
MARL WALL, CLAY MORTAR, BUILDER'S TRENCH
58A 57F
48U 47Z
4
5
60.8'
6
57F 57E
47Z 47Y
7
8
57E
47Y
62.13'
14
14C
14A
14B
3
3A
6A
9B
9
9A
19
19A
61.68'
REDDISH SAND
2
10A
10
KILN
BUILDER'S TRENCH
61.77'
61.46'
60.2'
11B
1
1A
11A
11
13A
13
REDDISH SAND
48U 47Z
48N 47T
47Y
47S
STOKE HOLE PIT
SOIL STAIN
TREE DISTURBANCE
47Y
47S
60.5
DISTURBED
MARL WALL, CLAY MORTAR, BUILDER'S TRENCH
STEP 2
ASH PIT (PIT 1)
STEP 1
20th CENTURY
60.4
21
20
12
60.5'
22.4' TO KILN
DISTURBED
SMALL KILN COMPLEX
YORKTOWN, VIRGINIA
0 1 2 3 4 6 8
FEET
COLLEGE OF WILLIAM AND MARY
WILLIAMSBURG, VIRGINIA
NORTH
KEY
PRIMARY POSTHOLE
SECONDARY POSTHOLE
POSTMOLD
BUILDER'S TRENCH
PITS
RED SOIL STAINS
MARL WALL, CLAY MORTAR
ELEVATIONS ARE IN FEET ABOVE SEA LEVEL
NO. 308 - 8

FIGURE 53

present in this area. Instead, various layers of burned sand were encountered.

At right angles to the main flue, and on each side of this flue, are four smaller flues, each 0.35-0.4 ft. in width. These eight flues, essentially spaces between brick arches, were passages through which hot air, circulating in the main flue-firebox area, entered the upper pot chamber. The flues are vertical to a point roughly one-half their height, at which point they slope toward the main flue. It is impossible to ascertain the original angle of this slope, due to heavy salt glaze buildup, melting, etc., in the flues. Pottery fragments and pieces of kiln furniture were also stuck to the sides of some flues, having fallen down from the pot chamber.

The lower end of each minor flue is 0.4 ft. above the bottom of the kiln. The maximum east-west distance within the flues is 4.25-4.35 ft.

In addition to the flues, four brick arches once spanned the main flue. Each arch was supported by 7-8 courses of brick. Arches 2, 3 and 4 were each 0.7-0.8 ft. (1 brick length) in width, and arch 1, above the firebox, was slightly wider - 1.1 ft. Arches are separated from one-another by the minor flues, a distance of 0.35-0.4 ft. Arches 1-4 were identical in shape to the surviving arch in the south wall of the kiln. The springer bricks of each arch are in identical position to the surviving arch. It is therefore probable that the vertical distance from the dirt floor of the kiln to the highest point of the underside of the arch was c.2.1 ft. This, therefore, was the verticl dimension of the main flue. The highest point of the upper side of the arch was c.2.5 ft. above the floor. It is therefore likely that the floor of the pot chamber was c.2.5 ft. above the lowest part of the kiln. Unlike the surviving arch (in the south wall), it is probable that arches 1-4 had been partially constructed of wedge-shaped bricks, since many fragments were found in the fill of the kiln.

The brick supports for arches 2 and 3 show signs of severe

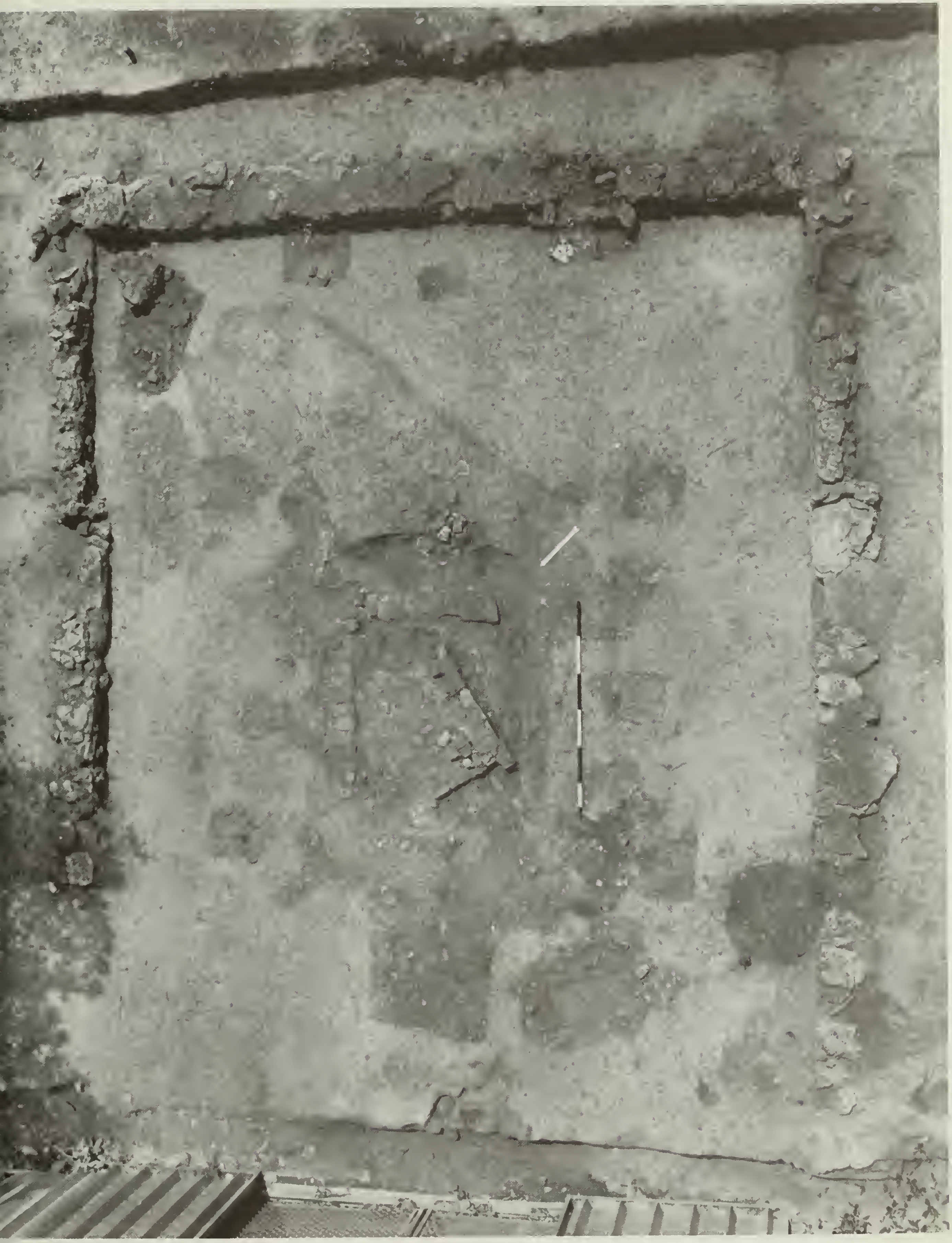


Figure 54. Small Kiln, plan view, showing features as found at subsoil level. Note filled postholes, pits, stain, kiln.

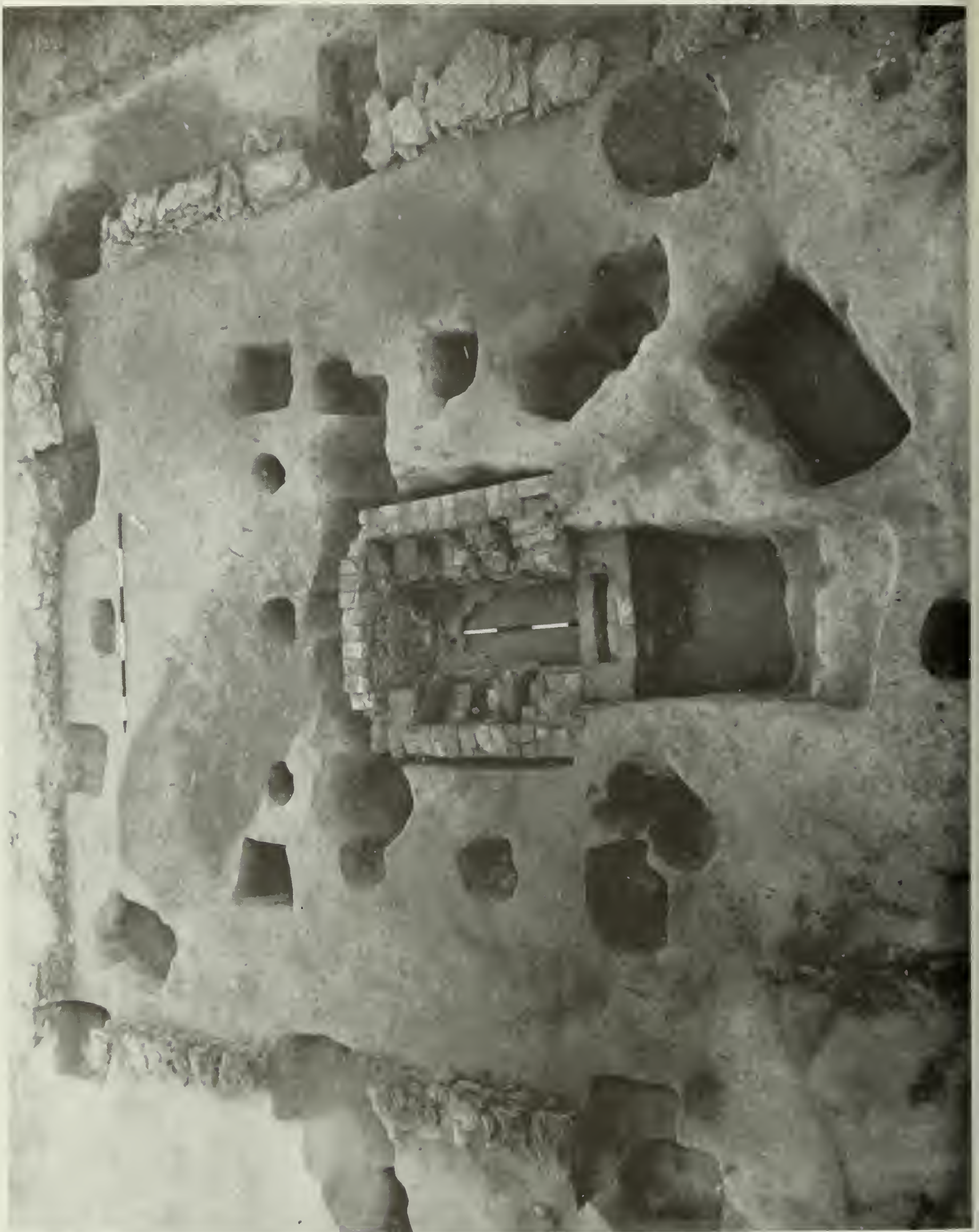


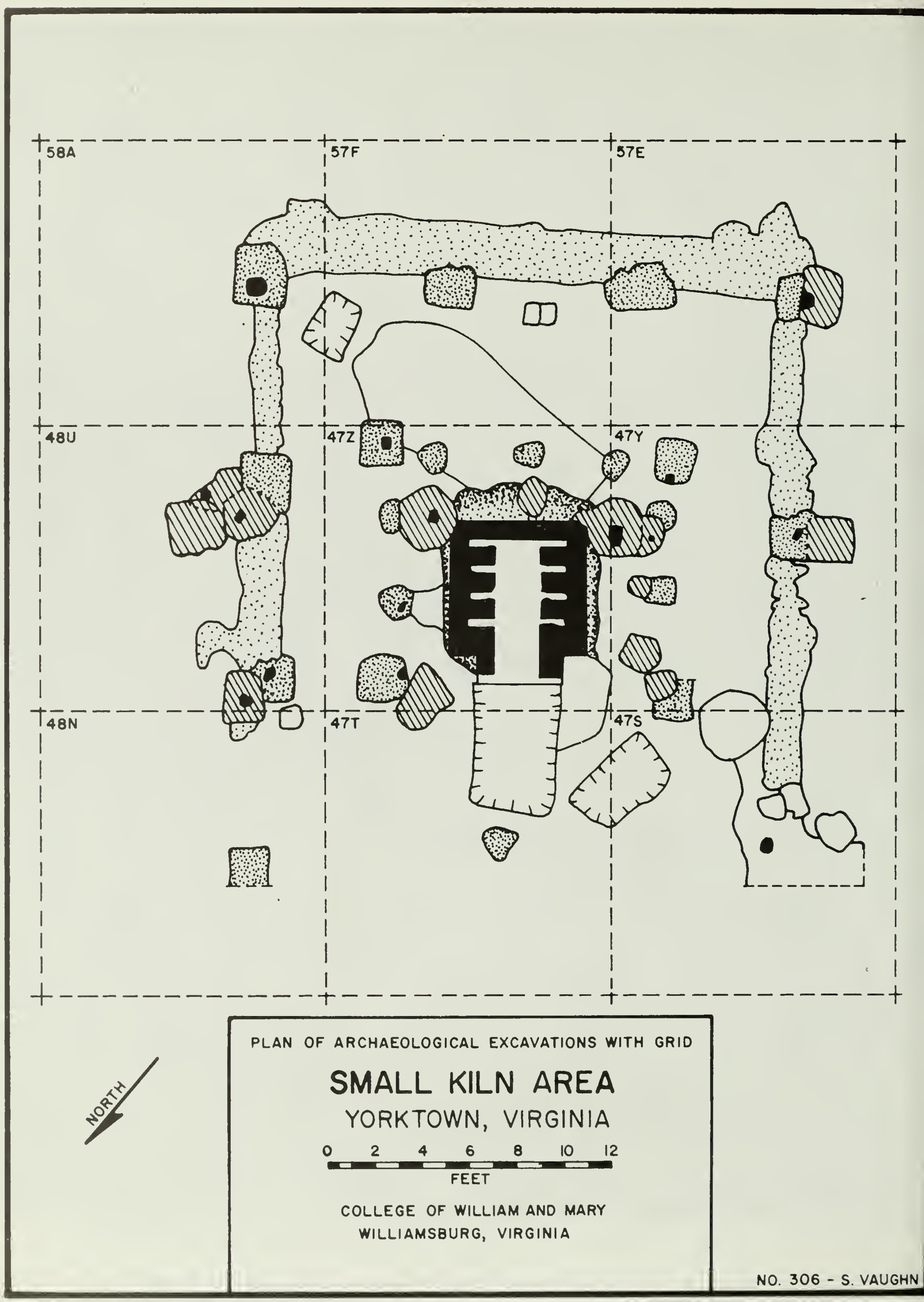
Figure 55. Small Kiln, plan view of excavated kiln, postholes, pits, with completely excavated marl wall-posthole complex. Looking south

melting and/or brick collapse. A thick (c.0.4-0.5 ft.) accumulation of salt glaze and melt is present at the base of the kiln between the supports of arch 4 and along the sides of the main flue to arch 2.

The firebox of the Small Kiln is defined by two completely preserved brick arches, situtated beteen arch 1 and the north wall of the kiln, and two ledges above the arches on the side walls of the front of the kiln. As is explained in the next chapter, logs to be burned rested on these ledges, eventually falling onto the arches for further combustion. Both arches are lower than the four previously discussed arches. The difference between the upper surface of the lower arches and the highest underside point of the upper arches was c.1 ft. The lower arches, each slightly curved, are each 2 ft. in length, the same dimension as the width of the main flue. The first lower arch is only 0.15 ft. from the north wall. The second lower arch is 0.2 ft. from the first. Both arches are 0.4-0.45 ft. in width and 0.4 ft. in thickness, as each is constructed of c.9-10 one-half bricks. The upper surface of both arches are heavily fire-melted, so that individual bricks are not discernable. The second lower arch is below the north one-half of the upper arch 1. The vertical distance between the lower arches (highest point) and the floor of the heat chamber is only 0.7-0.8 ft. (or c.0.1-0.2 ft. lower than the stoke hole).

The kiln was approached (by the potter) from an excavated hole on the north side. A stoke hole pit, excavated into subsoil to the same depth as the kiln, measures 5.6 ft. in length (includes stairs) and 3.8 ft. in width. Two steps, carved from subsoil, lead down to a 3.2 ft. x 3.8 ft. area immediately in front of the stoke hole. In this small area, the potter could reach over the north wall to load firewood onto the ledges of the firebox. The potter could also rake out ashes from beneath the lower arches through the stoke hole in the north wall.

In sum, the Small Kiln was a relatively small, well-built and well-designed kiln. An upper pot chamber rested upon the



PLAN OF ARCHAEOLOGICAL EXCAVATIONS WITH GRID

SMALL KILN AREA

YORKTOWN, VIRGINIA

COLLEGE OF WILLIAM AND MARY
WILLIAMSBURG, VIRGINIA

FIGURE 56

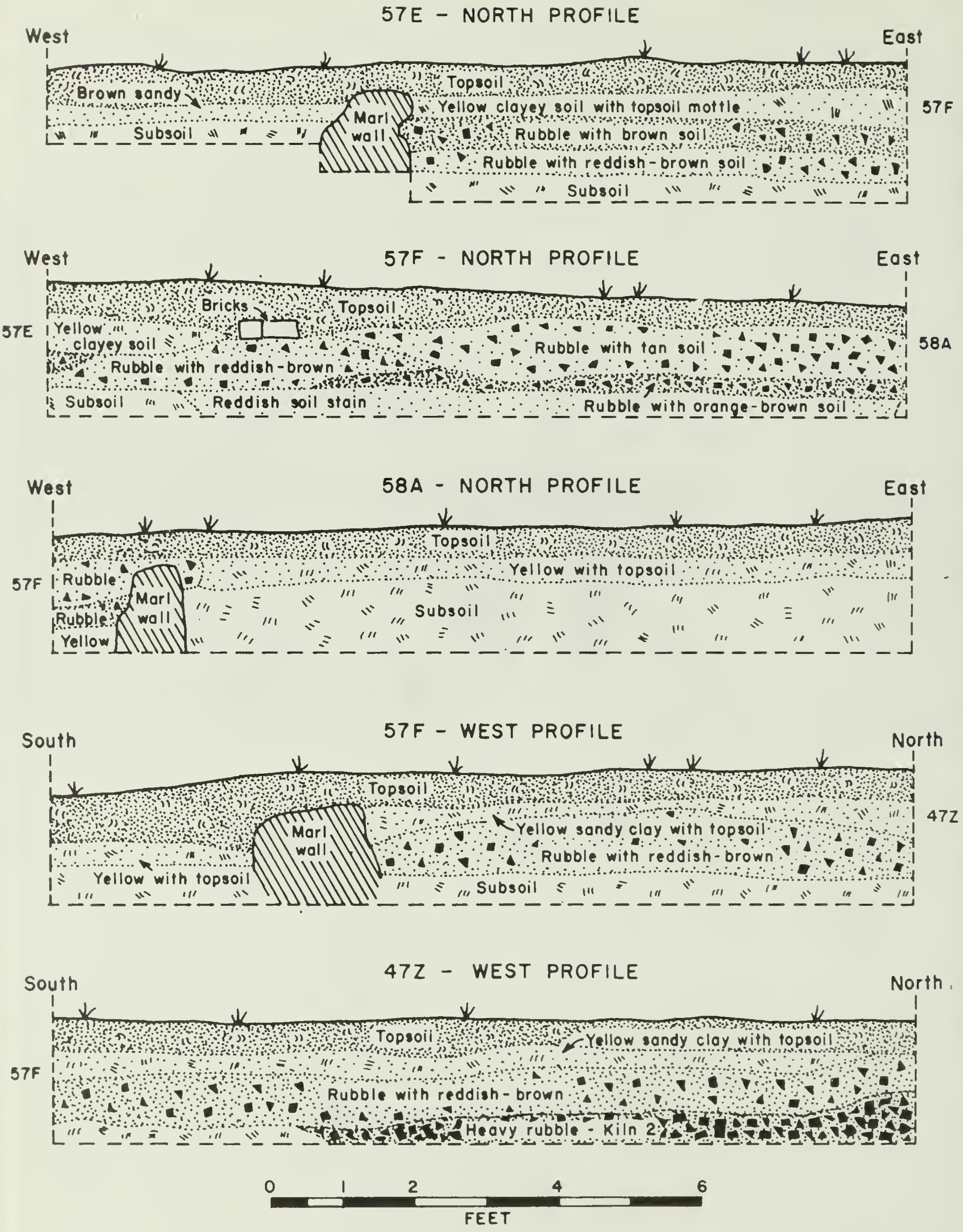
brick of the lower heat chamber. This upper pot chamber had its own entrance door, which was bricked up when the kiln was being fired. This door was probably located on the north side of the kiln. The four arches of the lower chamber provide a strong base for the floor of the pot chamber. Hot air, created in the firebox, rose into the pot chamber through the flue system.

As mentioned above, it is believed that short logs were stacked and burned on ledges above the lower arches. The lower arches not only created a surface where air could circulate under the fire, but they also created a space beneath the fire for the accumulation of ash. The small stoke hole in the north wall, too small for loading logs through, was not only an area through which air could enter the firebox area, it was also a convenient opening for raking ashes into the stoke hole pit. Ashes were apparently shoveled from here into an adjacent but separate ash pit (Figures 53-55, 93). This ash pit measured 4 ft. by 2.6 ft. by 2 ft. and contained various ash lenses.

Fill of the Small Kiln

When found, the kiln and stoke hole pit were filled with large amounts of brick rubble and soil (Figures 41-50, 54). Three primary levels could be discerned with the fill: Level 1 (uppermost) - a red to reddish-brown sand containing much brick rubble, the rubble being more concentrated in some areas than others. This level varied in thickness between 1.0-2.8 ft.; Level 2 - a layer of light brown sand and clay containing brick rubble, 0.2-2.0 ft. in thickness; Level 3 - at the bottom of the kiln, a 0.1-0.3 ft. thick lens of ash. Levels 1 and 2 represent post-kiln debris, but the debris is probably from the Small Kiln structure and immediate area. Numerous pottery crossmends between Levels 1 and 2 attest to the contemporaneity of the two levels. Level 3 is contemporary with the operation of the kiln.

As previously mentioned, builder's trenches were noticeable on the west, south, and east sides of the kiln (Figure 51).



STRATIGRAPHIC PROFILES

No. 307 - S. Vaughn

FIGURE 57

Apparently these had been filled soon after construction of the kiln. The trenches varied in width from 0.2 ft. (east side) to 1.1 ft. (south side of kiln). The south builders trench may have been widest because of the construction of the arch in the south wall of the kiln. A total of 17 pottery fragments were found in the builders trench fill, indicating that pottery had been manufactured at the site prior to the operation of the Small Kiln.

The builders trench material pre-dates the operation of the Small Kiln. All 17 sherds found in this fill are earthenware, both bisque [fired, but unglazed] (11) and glazed (6).

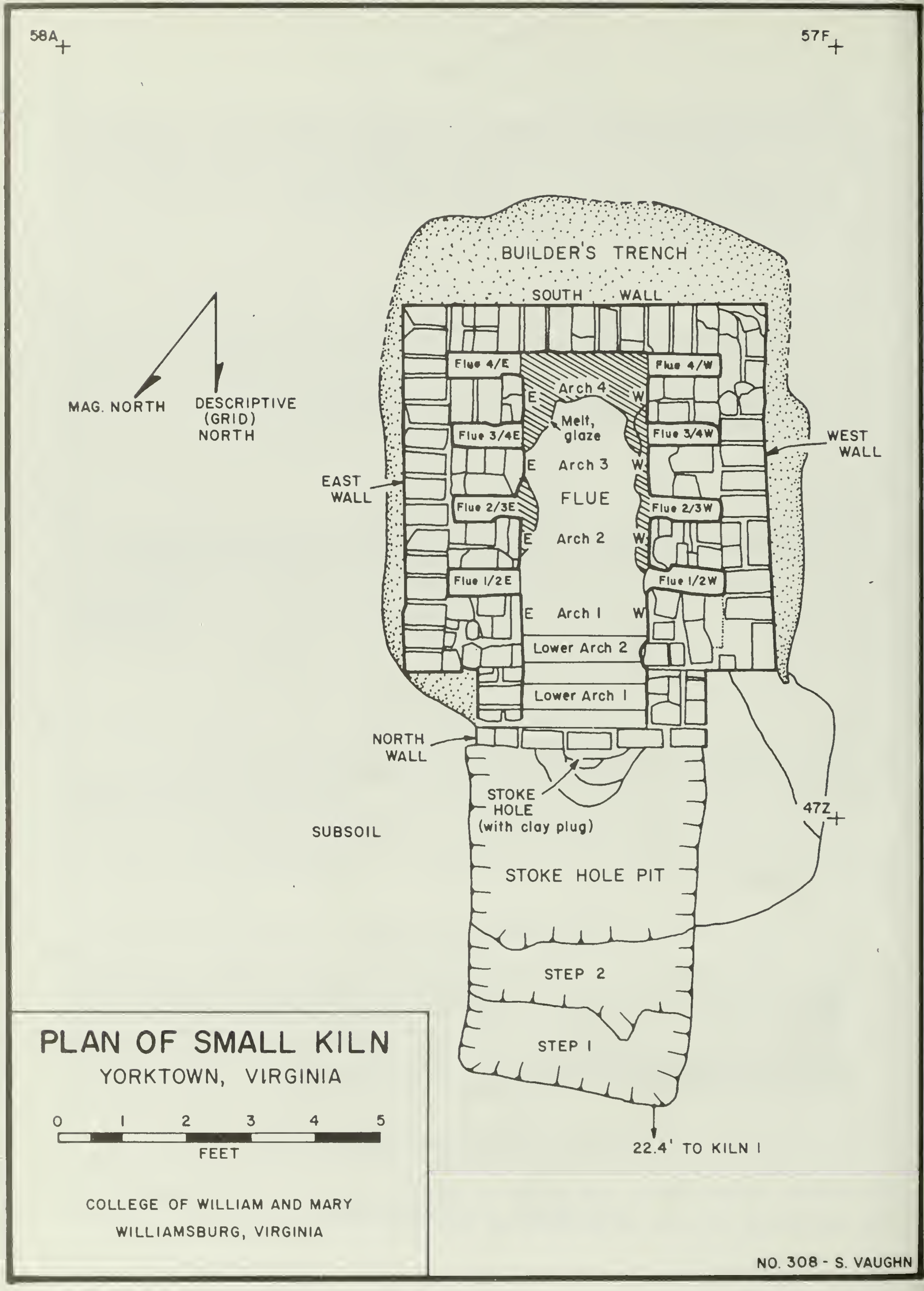
Level 3, the ash layer, is contemporary with the operation of the Small Kiln. The ceramics from this level totaled 84 in number: earthenware - bisque (18) and glazed (3); stoneware - bisque (11) and glazed (52). This indicated a preponderance of stoneware, but it also is significant in the amount of earthenware present. This evidence seems to indicate that both earthenwares and stonewares were fired in the Small Kiln. Also, bisque firings as well as glost (glazed) firings were carried out in the kiln.

Earthenware forms from Level 3 include only unidentifiable shapes (21 sherds). Stoneware shapes include mostly mugs (9 bisque, 14 glazed), unidentified forms (17), and kiln furniture (23 saggar lid fragments).

Postholes and Marl Wall

A total of 35 postholes were discerned in the area of the marl wall-kiln complex. All were first found at subsoil level. Of the 35 postholes, 18 were found in the immediate vicinity of the Small Kiln. The other 17 were found associated with the marl wall. (Figures 53-55).

Twenty-one of the 35 postholes can be termed primary, as they were built before the other 14 postholes. The latter can be termed secondary, as these postholes intrucde into, and are therefore later than, the primary postholes. It is believed that the majority of the 35 postholes are associated with the Small



PLAN OF SMALL KILN
YORKTOWN, VIRGINIA

COLLEGE OF WILLIAM AND MARY
WILLIAMSBURG, VIRGINIA

FIGURE 58

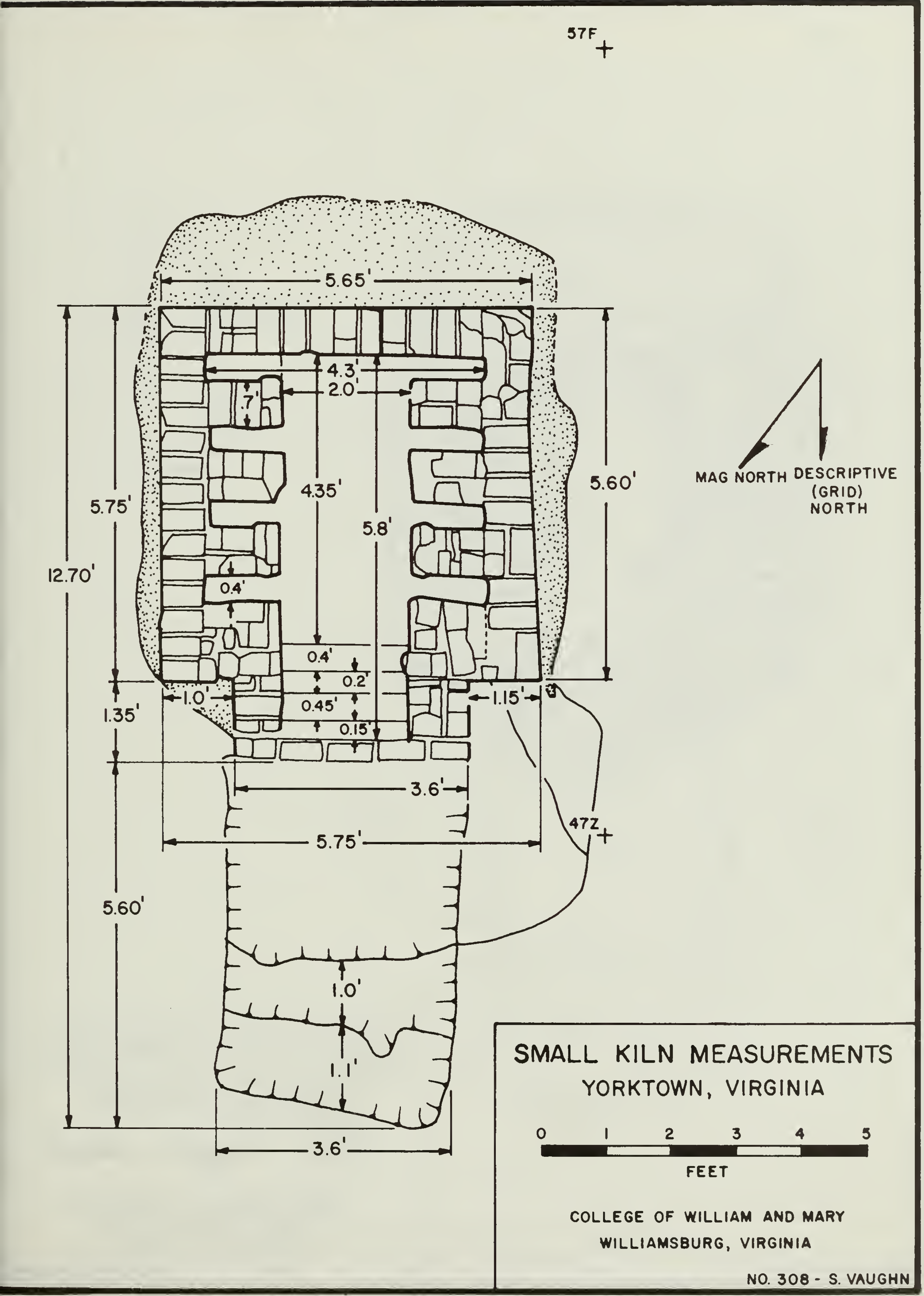

57F
5.65'
4.3'
2.0'
.7'
4.35'
5.8'
5.75'
5.60'
12.70'
0.4'
0.4'
0.2'
0.45'
0.15'
1.0'
1.15'
1.35'
3.6'
5.75'
47Z
5.60'
1.0'
1.1'
3.6'
MAG NORTH
DESCRIPTIVE (GRID) NORTH
SMALL KILN MEASUREMENTS
YORKTOWN, VIRGINIA
0
1
2
3
4
5
FEET
COLLEGE OF WILLIAM AND MARY
WILLIAMSBURG, VIRGINIA
NO. 308 - S. VAUGHN

FIGURE 59

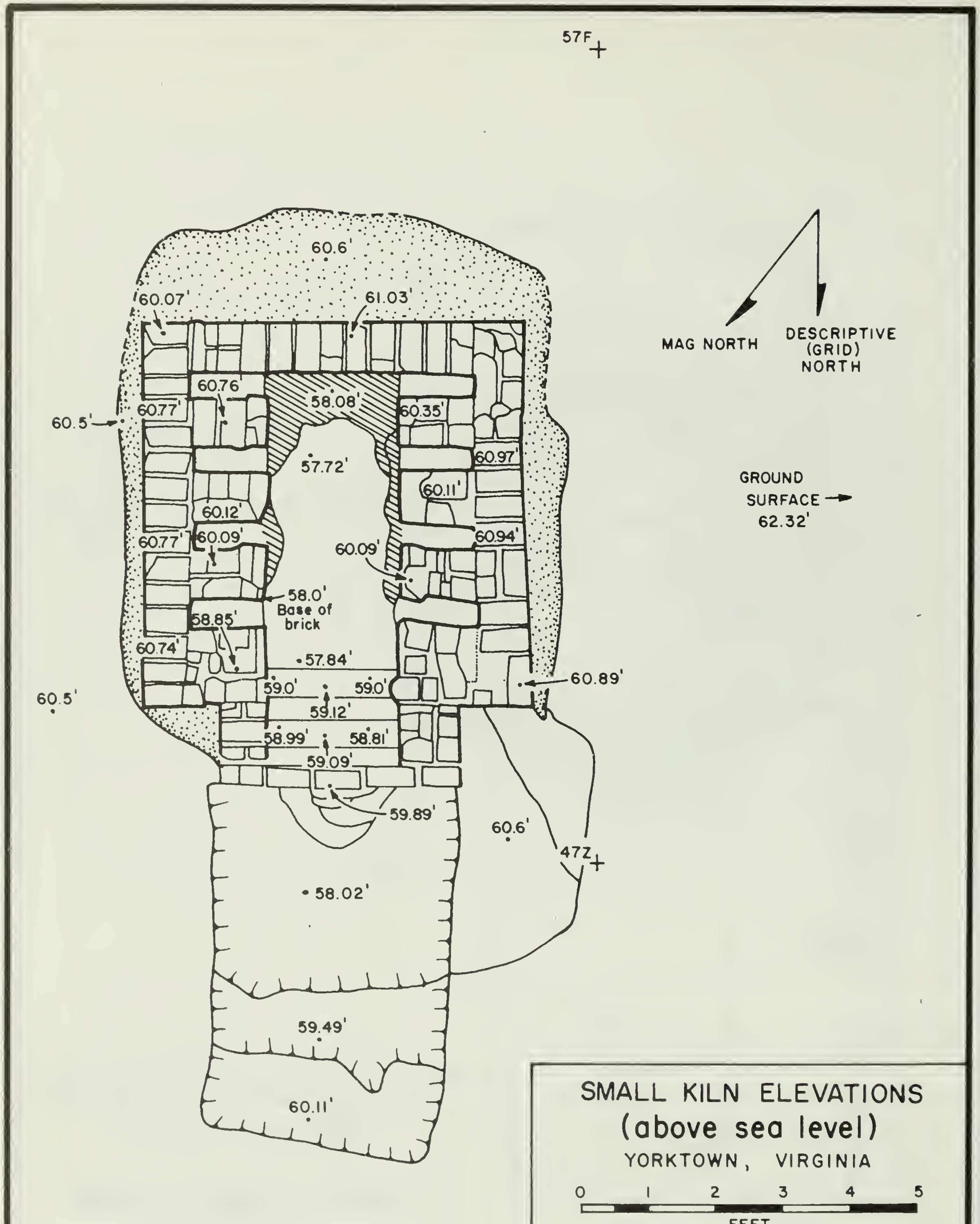
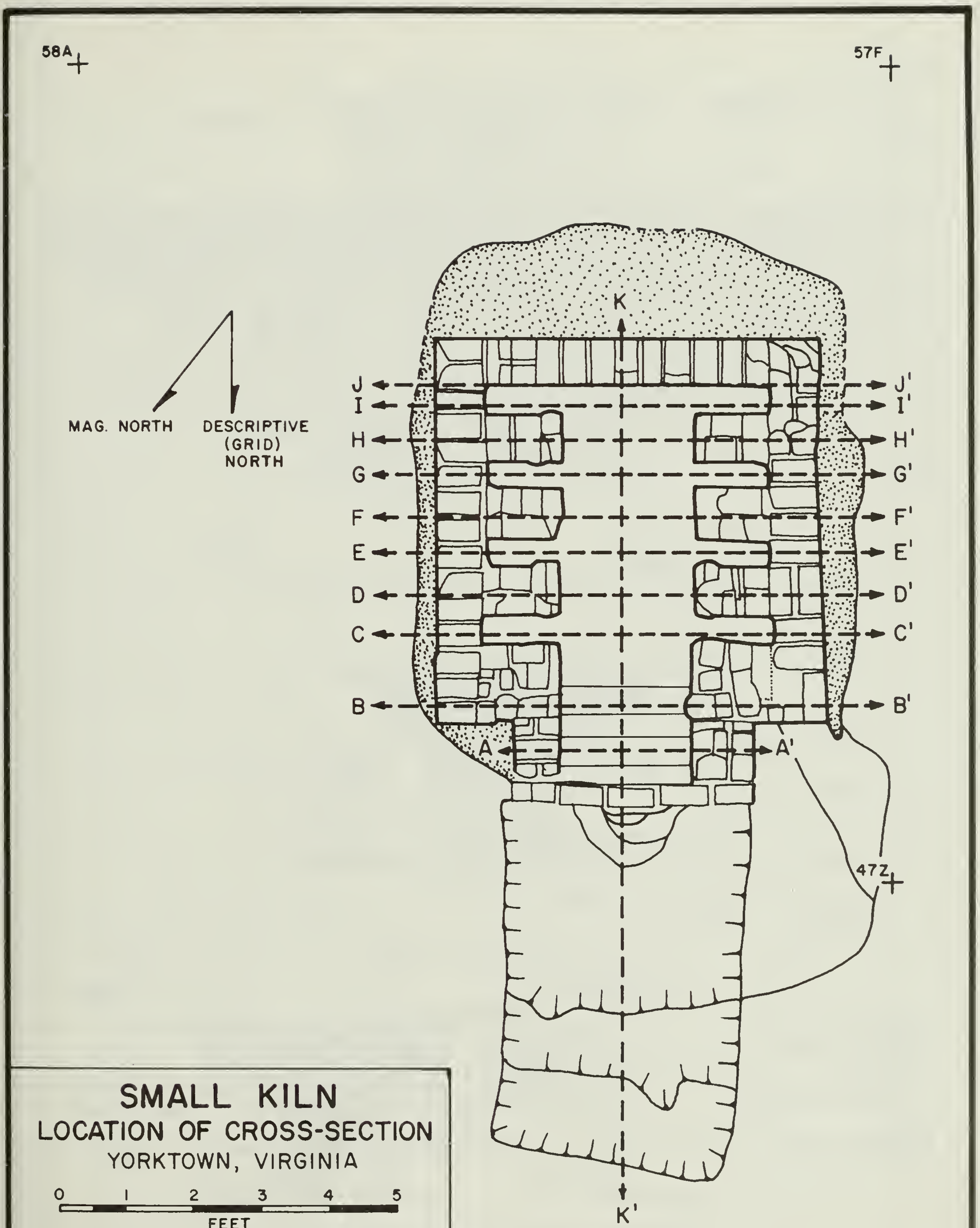

57F
60.6'
60.07'
61.03'
MAG NORTH
DESCRIPTIVE (GRID) NORTH
60.76'
60.77'
58.08'
60.35'
60.5'
57.72'
60.97'
60.11'
GROUND SURFACE 62.32'
60.12'
60.77'
60.09'
60.09'
60.94'
58.0' Base of brick
58.85'
60.74'
57.84'
59.0'
59.0'
60.89'
60.5'
59.12'
58.99'
58.81'
59.09'
59.89'
60.6'
47Z
58.02'
59.49'
60.11'
SMALL KILN ELEVATIONS
(above sea level)
YORKTOWN, VIRGINIA
0
1
2
3
4
5
FEET
COLLEGE OF WILLIAM AND MARY
WILLIAMSBURG, VIRGINIA
NO. 310 - S. VAUGHN

FIGURE 60

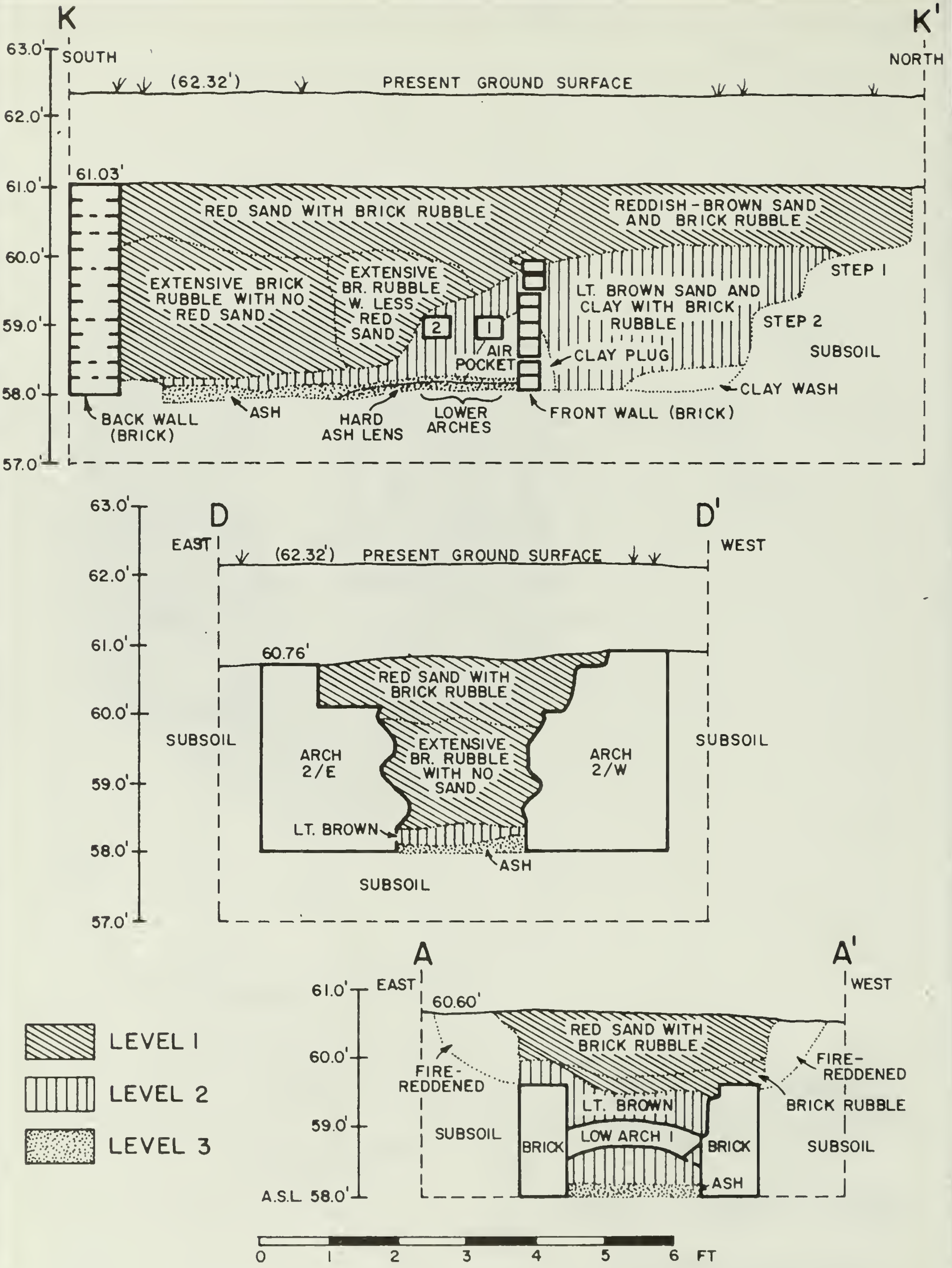


SMALL KILN
LOCATION OF CROSS-SECTION
YORKTOWN, VIRGINIA

COLLEGE OF WILLIAM AND MARY
WILLIAMSBURG, VIRGINIA

NO. 311 - S. VAUGHN

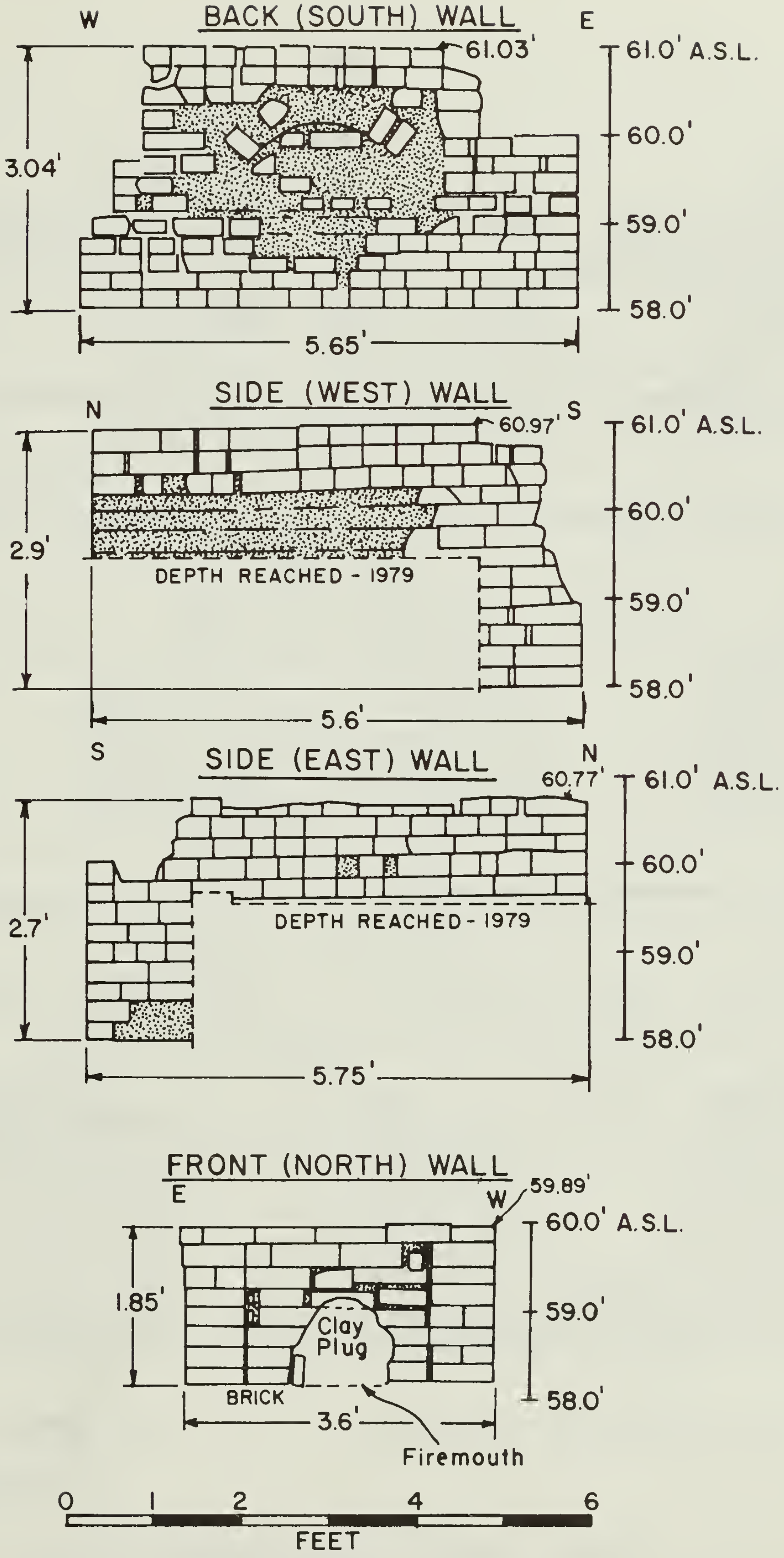
FIGURE 61



SMALL KILN-SECTIONS THROUGH FILL

NO. 312 - S. VAUGHN

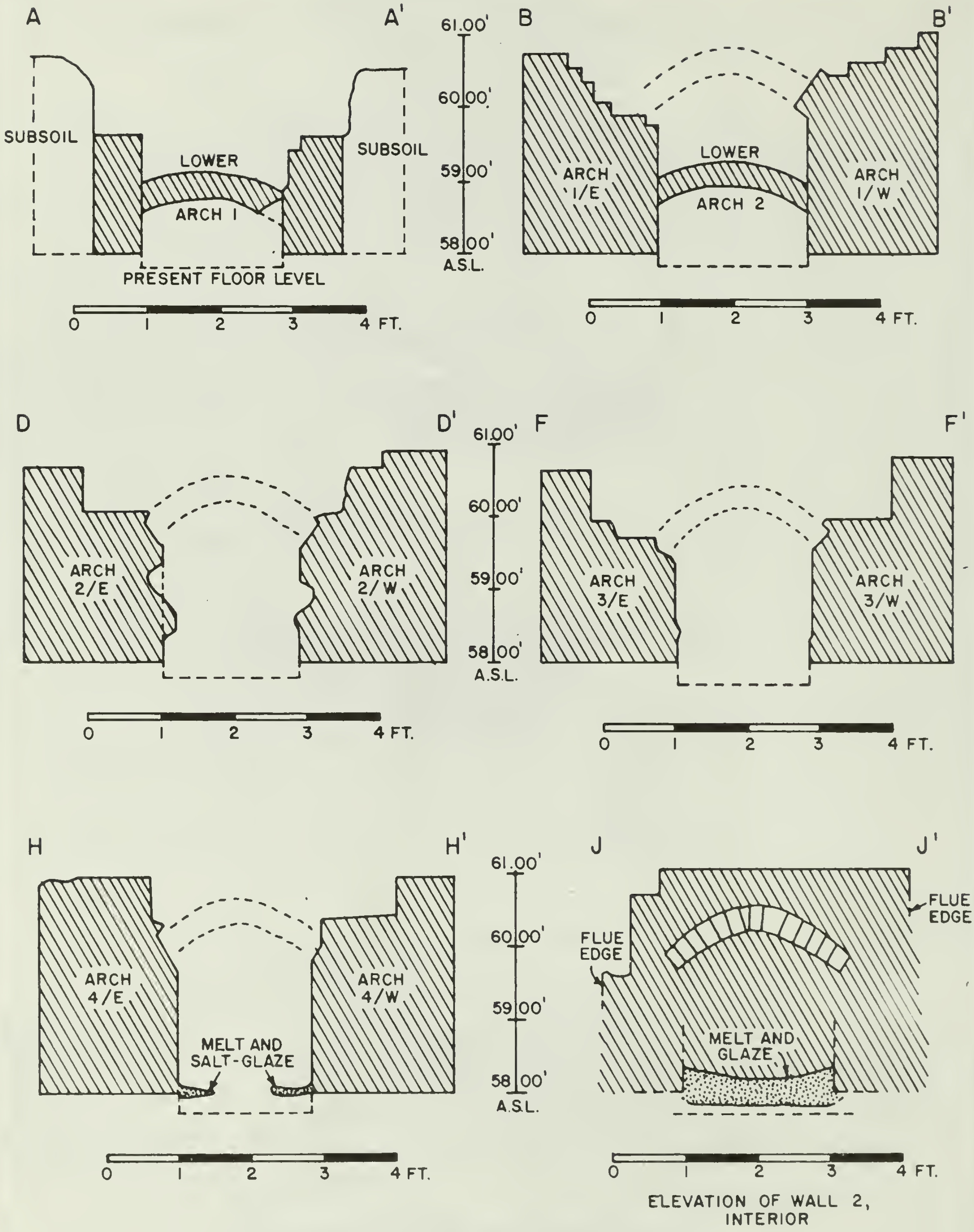
FIGURE 62



SMALL KILN-EXTERIOR ELEVATIONS

S. VAUGHN - NO. 313

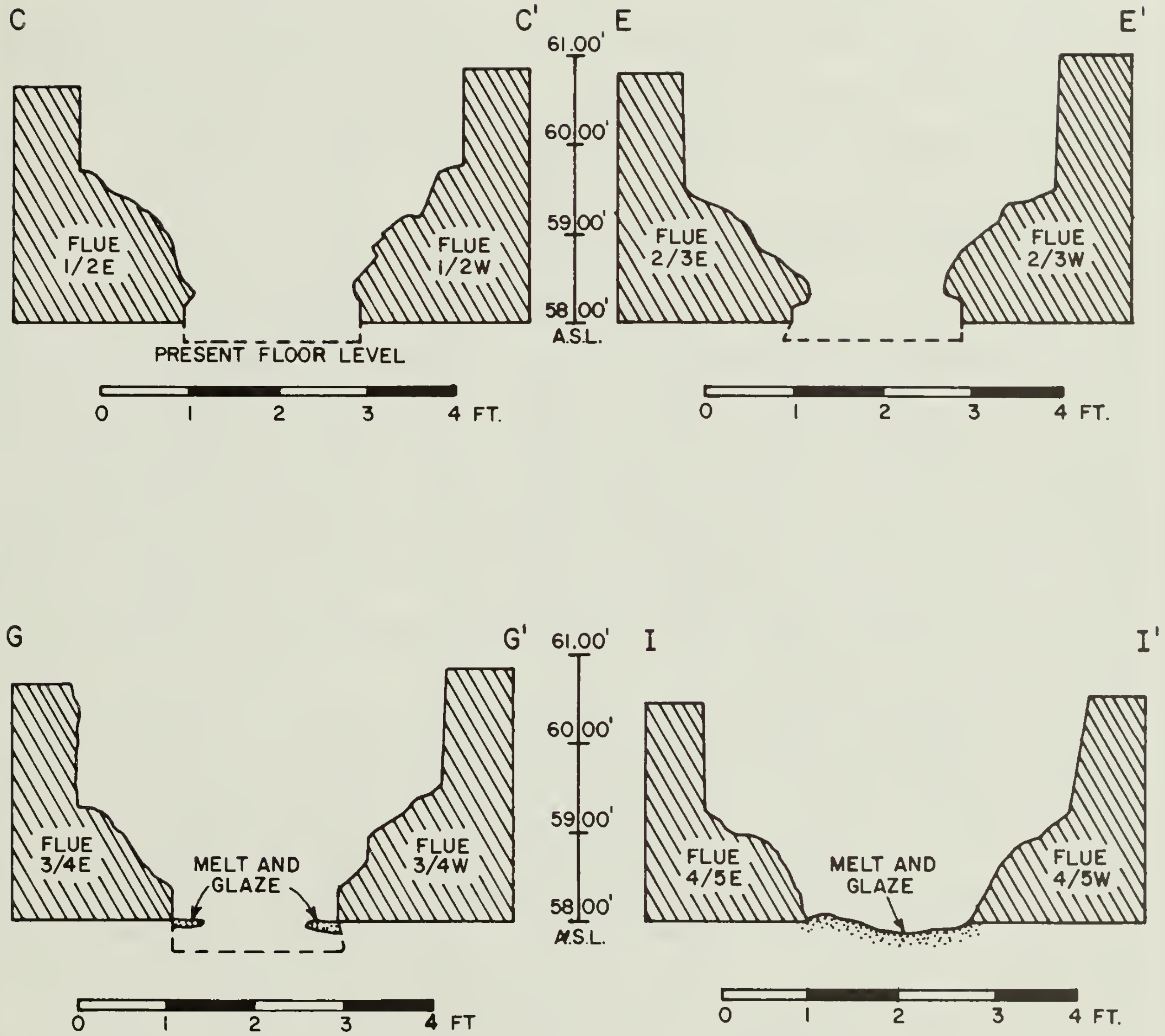
FIGURE 63



SMALL KILN-SECTIONS THROUGH ARCH SUPPORTS

NO. 314 - S. VAUGHN

FIGURE 64



SMALL KILN - SECTIONS THROUGH FLUES

NO. 315 - S. VAUGHN

FIGURE 65

Kiln, a point to be discussed later.

Table 1 summarizes the dimensions of all postholes and associated postmolds. Postholes vary in size and shape and only 15 contained evidence of postmolds. The majority of postholes contained quantities of Yorktown pottery in their fill.

Postholes, Immediate Small Kiln Area

Postholes 1-11 are probably the earliest postholes associated with the Small Kiln. These postholes, regularly spaced every two to four feet apart, each c.2 ft. from the kiln, delineate the remains of a 10 ft. (north-south) by 12 ft. (east-west) wooden structural support system. This system was a bracing mechanism, which braced only the brick kiln. Therefore, postholes do not extend parallel to the stoke hole pit. (Figure 53). However, as will be discussed later, posthole 21 may have supported a structural feature for the stoke hole.

The postholes are of two different sizes - four larger but shallower corner postholes (nos. 1,4,8,11) and seven smaller but deeper postholes (nos. 2,3,5,6,7,9,10). The corner postholes measure 1.7 ft. x 1.8 ft. or slightly larger and reach a depth of from 1.1 ft. to 1.47 ft. below subsoil (Table 1). Remains of postmolds were found in postholes 1, 4 and 8. These postmolds were small in size - 0.4-0.5 ft. in diameter - in comparison to the size of the posthole. Postmolds 1 and 4 had marl or brick supports at the basal end.

The seven smaller postholes are equally spaced between the corner postholes, with two each along the east and west walls and three between corner posts 4 and 8. The postholes are circular to squarish in shape, measuring 1.0 ft. to 1.4 ft. in diameter. (Table 1). Postholes 5, 6, and 7 are the deepest of the eleven postholes contemporary with the kiln, measuring 2.11 ft. to 2.25 ft. in depth. Postholes 9 and 10 are not as deep, but reach a greater depth than postholes 2 and 3. Only the fill of posthole 2 contained evidence of a postmold (0.4 ft. in diameter), signifying

TABLE 1. DIMENSIONS AND ELEVATIONS OF POSTHOLES - POSTMOLDS

Posthole			Posthole Size			Elevations (ASL)				
Pr.	Sec.	Location	E-W	N-S	Posthole Depth	Surface	Posthole Base	Postmold Base	Postmold Size	See Figure Nos.
1		47Z13	2.2	1.9	1.44	60.20	58.76	58.63	0.4 d.	53, 91
	1A	47Z14	1.6	2.4	1.20	60.20	59.00	-	-	"
2		47Z19	1.4	diam.	1.36	60.40	59.04	58.67	0.4 d.	"
3		47Z20	1.0	1.2	1.60	60.57	58.97	-	-	"
	3A	47Z24	2.4	diam.	2.16	60.69	58.53	59.69	0.5x0.7	"
4		47Z16	1.7	2.0	1.47	60.70	59.23	59.78	0.5 sq.	"
5		47Z15	1.2	diam.	2.22	60.70	58.48	-	-	"
6		47Z23	1.2	diam.	2.11	60.80	58.69	-	-	"
	6A	47Z21	1.2	1.6	1.63	60.60	58.87	-	-	"
7		47Z22	1.0	diam.	2.25	60.76	58.51	-	-	"
8		47Y19	1.7	2.0	1.20	60.80	59.60	58.50	0.4x0.5	"
9		47Y10E	1.2	1.2	1.80	60.60	58.80	-	-	"
	9A	47Y10B	1.2	1.5	1.20	60.60	59.50	60.05	0.3 d.	"
	9B	47Y10F	2.5	2.0	1.40	60.60	59.20	59.30	0.5x0.9	"
10		47Y10C	1.5	1.2	1.80	60.80	59.00	-	-	"
	10A	47Y10G	0.9	0.9	1.48	60.80	59.32	-	-	"
11		47Y10D	1.8	1.7	1.10	60.50	59.10	-	-	"
	11A	47Y12	1.4	1.2	1.90	60.50	59.30	-	-	"
	11B	47Y13	1.7	1.6	2.10	60.50	58.50	-	-	"
12		48N12	1.6	1.5	1.30	60.43	59.43	-	-	"
13		48U10	1.6	1.9	0.80	60.66	59.86	59.70	0.5x0.6	"
	13A	48U12	1.6	2.2	1.10	60.56	59.46	59.60	0.4x0.8	"
14		48U14	2.2	2.5	1.20	61.66	59.91	-	-	53, 92
	14A	48U17	2.2	2.4	2.20	61.17	58.97	-	-	"
	14B	48U15	2.1	2.3	1.60	60.98	59.38	60.10	0.3x0.5	"
	14C	48W6	1.1	diam.	1.20	60.97	59.77	60.19	0.4 d.	"
15		58A6	2.1	2.7	1.30	61.14	59.44	59.94	0.8 d.	"
16		57F11	2.1	1.9	0.70	60.92	60.22	-	-	"
17		57E11	2.8	2.0	2.00	61.37	59.37	-	-	"
18		57E14	1.1	1.6	0.60	60.74	60.14	-	-	"
	18A	57E12	1.7	2.4	1.50	60.98	59.48	59.78	0.7 d.	"
19		47Y21	1.5	2.0	1.30	60.88	59.58	59.58	0.4x0.6	"
	19A	47Y22	2.1	1.9	1.20	61.01	59.81	-	-	"
20		47S13	?	?	1.00	61.03	59.93	60.43	0.7 d.	"
21		47T22	1.3	diam.	1.20	60.49	59.29	-	-	"

Dimensions and elevations in feet

ASL = above sea level; d = diameter; Pr = primary; Sec = secondary; E-W = east-west; N-S = north south that the other posts may have been removed from the ground prior to rotting.

A series of 8 secondary postholes (nos. 1A,3A,6A,9A,10A, 11A,11B) are adjacent to the 11 primary postholes and intrude into the latter. It is interesting to note that all of these seondary postholes are on the kiln side of the primary postholes. The secondary postholes are irregular in size and shape as compared with postholes 1-11. The largest and smallest postholes measure 2.4 ft. in diameter (no. 3A) and 0.9 ft. square (no. 10A) respectively. Postholes 9A-9B are double postholes, with 9B cutting into and therefore antedating posthole 9A. However, both are later in date than adjacent primary posthole 9. Postmolds could be discerned only in postholes 3A, 9A, and 9B.

The secondary postholes-postmolds are more recent in date than the primary postmolds. Two explanations are possible to explain these features. The first explantation assumes that the secondary postholes were originally dug when the kiln was out of existence and unknown to the posthole diggers. The evidence for this is as follows: 1). as noted above, the postholes intrude into the primary postholes; 2). postholes 3A, 6A, and 9B intrude into the filled builders trench of the Small Kiln; 3). postholes 3A and 9B destroyed portions of the corners of the Small Kiln, signifying that the kiln was no longer in operation; 4). the fill of the secondary postholes contained large amounts of brick and mortar rubble, kiln furniture, and Yorktown ceramics, whereas the fill of the primary postholes was different, containing little debris and ceramics. The rubble and ceramics found in quantity in the secondary posthole fill possibly came from the general post-destruction debris layers which covered the Small Kiln.

The second explanation assumes that the secondary postholes were contemporary with the operation of the kiln, but later in date than the primary postholes. Perhaps the secondary postholes also represent the remnants of a later bracing system, which was built closer to the kiln because it had to be built in this position. It was thereby necessary for the potters to actually chop away or partially destroy the two corners of the kiln. The fill found in the secondary postholes is probably not post-destruction debris, as suggested previously.

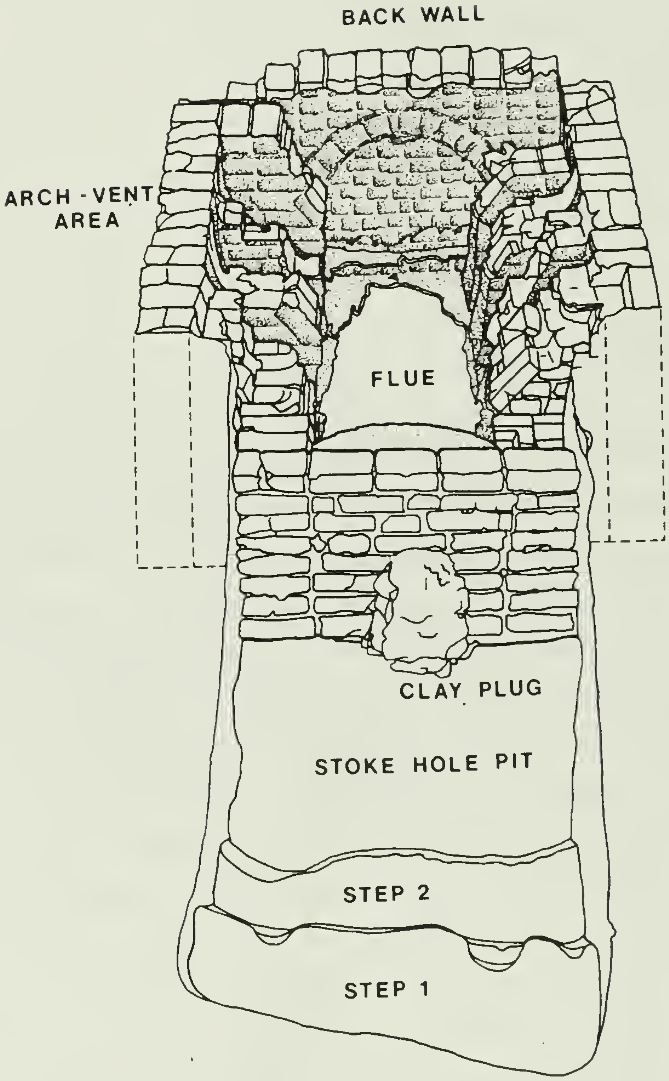
Given the perfect alignment of the secondary postholes vis a vis the kiln, it seems most likely that the second explanation given above is the correct one. It is hard to believe that both primary and secondary sets of postholes were not placed by the potters.

Marl Wall Postholes

The kiln and postholes 1-11 are symmetrically situated within a three-sided perimeter marked by a low marl wall. The maximum area encompassed within the marl wall measures 21 ft. (east-west) by 24 ft. (north-south). The marl wall varies in width between 1-2 ft. It is constructed of numerous irregularly shaped marl blocks, the largest measuring c.2 ft. square, the smallest only several inches in diameter. The wall was laid in a builders trench using clay as a bonding agent or filler. The wall extends 1-2 ft. into subsoil and survives to a maximum height of c.5 courses. The north end of the east wall was destroyed in the 19th or early 20th century. No evidence of an east-west oriented north marl wall was discovered. Such a wall probably was never built, due to necessary passage between the Large and Small Kilns.

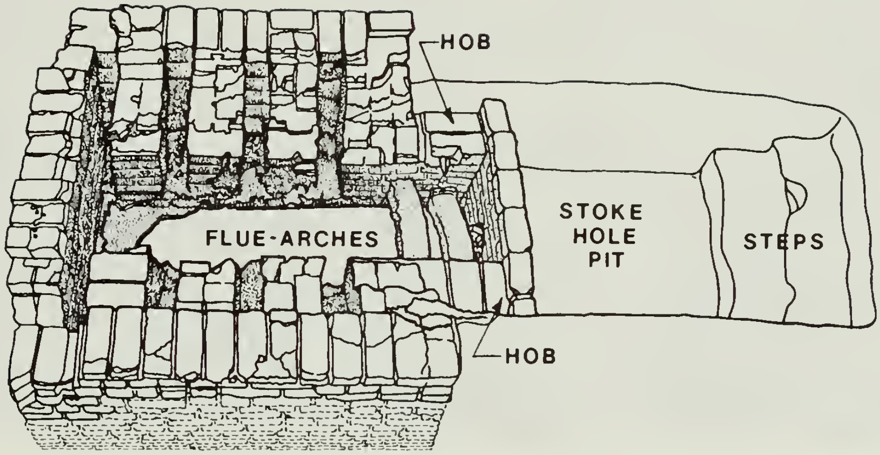
Nine primary postholes are an integral part of the marl wall. Six adjacent postholes intrude into some of the primary postholes and are therefore later in date but probably contemporary with the kiln. The secondary posts were replacement posts. Paired primary and replacement posts are as follows (Figure 53): 13-13A, 14-14A-C, 18-18A, 19-19A. There was no evidence of replacement posts for postholes 12,15,16,17,20,21. The replacement posts that do occur alway are situated toward the exterior of the nearby primary post.

Table 1 gives the dimensions and depths of all postholes. The full dimensions of some primarypostholes, cush as no. 18,



PERSPECTIVE DRAWING OF SMALL KILN

FIGURE 66



PERSPECTIVE DRAWING OF SMALL KILN

FIGURE 67

are not fully known, since secondary postholes destroyed portions of them.

The primary postholes do not intrude into the marl wall. The primary posts once contained within the postholes were erected as an integral part of the marl wall structure. Both primary posts and marl wall were constructed at the same structural time. It is probable that postholes were dug, after which one post was placed within each posthole, and then the posthole was filled around the post. A builders trench was dug next and the marl wall built into it. The builders trench intruded slightly into each filled posthole. The marl blocks of the wall also overlapped the top of the filled postholes. The marl wall definitely did not continue across the postmold. It appears that a 1-2 ft. gap existed in the marl wall at each primary posthole. This gap was only partially filled by the wooden posts.

The above gaps were present only in the east and west walls, at postholes 12 (?), 13,14, 15 (east wall) and 18,19, 20 (?) (west wall). Postmolds (gaps) 12 and 20, 14 and 19, 15 and 18, correspond to one-another (Figure 53). No posthole was found in the west wall opposite posthole 13 (east wall). Postholes 15-18 were corner postholes, but they had been constructed within the east and west walls, not in the south wall. Postholes 12 and especially 20 had been disturbed.

In the south marl wall, postholes 16-17 are adjacent to the interior edge of the wall and not within the wall itself. These postholes align themselves perfectly with the corner postholes (15,18). The reason for their position is unknown at this time.

Only postholes 13,14,18 and 19 have secondary replacement posts next to them. Posthole 14 has multiple secondary posts next to it. Posthole 14A is 1 ft. distant from posthole 14 and may be earlier in date than it, since it contained only one pottery fragment in its fill. Posthole 14B intrudes into 14 and is in turn cut into by posthole 14C.

Primary postholes 13,15,19,20 showed evidence of postmolds (Table 1). Secondary postholes 13A,14B,14C, 18A contained postmolds.

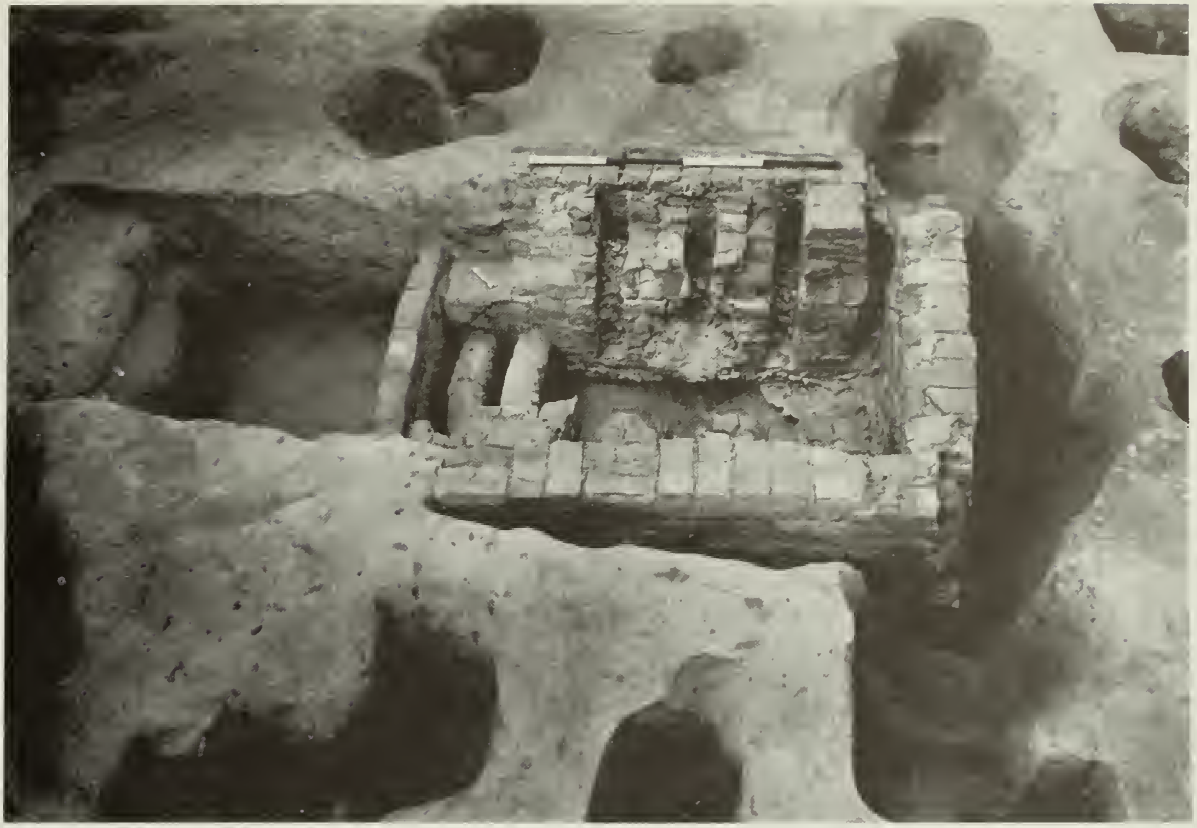


Figure 68. Small Kiln, closeup view with postholes. Looking east.

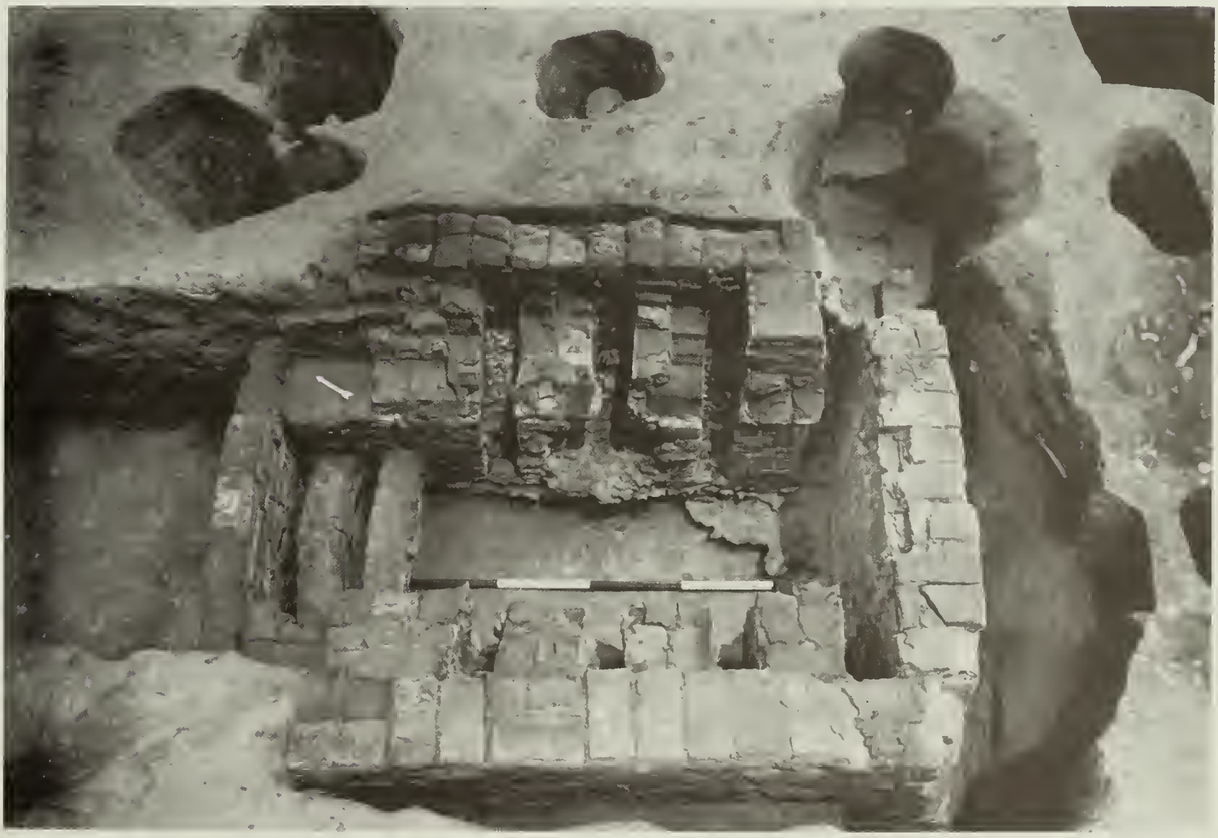


Figure 69. Small Kiln, closeup view with postholes. Looking east.

These latter postmolds were situated outside or toward the exterior edge of the marl wall.

Discussion and Summary

The marl wall and 35 postholes represent the remains of contemporary structures that once served the Small Kiln. The position, ceramic fill, and the relative dating of the postholes permit speculations about the various aspects of the structures.

As previously discussed, the postholes-postmolds situated immediately around the kiln itself suggest that the kiln was braced by wooden logs, and that two bracing systems were built at different times. A system of vertical, horizontal, and perhaps angling green logs structurally supported the kiln from movement caused by alternative heating and cooling of the brick. The logs served the same purpose as the wide iron bands put around later bottle kilns. Such bands, if known, were undoubtedly impossible to find or manufacture in colonial Virginia.

Evidence exists for a roofed structure, which protected the Small Kiln from the elements. The kiln and bracing posts were flanked on three sides by a 24 ft. square structure, represented by low marl walls and posthole-postmolds. No marl wall was built on the north side in order to permit easy access to the Large Kiln area. The absence of this marl wall argues for the contemporaneity of the Large and Small Kilns.

The structure was supported by 10 wooden posts. Marl blocks had been placed between the upright posts on the west, south and east sides of the structure. It is not know whether the marl blocks were used to support a wooden sill, in which case interrupted sill construction was utilized, or whether marl was merely piled up to a height of 4-5 ft. in order to keep out animals, wind, etc., from the kiln area. Side walls were probably not as essential as a roof.

The contemporaneity of the Small Kiln and the marl wall structure is inferred from the symmetrical position of the kiln within the marl walls. If the marl wall was later in date than the kiln, meaning that the kiln was out of operation and perhaps not visible, it seems highly unlikely that the kiln would occupy such a symmetrical arrangement with the marl wall.

Evidence exists that something earlier, connected with the pottery factory, had gone on in the immediate area prior to the construction of the Small Kiln. The evidence is as follows:
1). numerous ceramic fragments were found within both the fill of the marl wall itself, builders trench, and the postholes;
2). postholes-postmolds 4 through 7, as well as the south builders trench of the kiln, intrude into an earlier red soil stain. The stain is fire effected earth that had been dumped in a hole on this spot (Figure 53). The activity referred to above may have gone on in conjuction with the firing or construction of the Large Kiln.

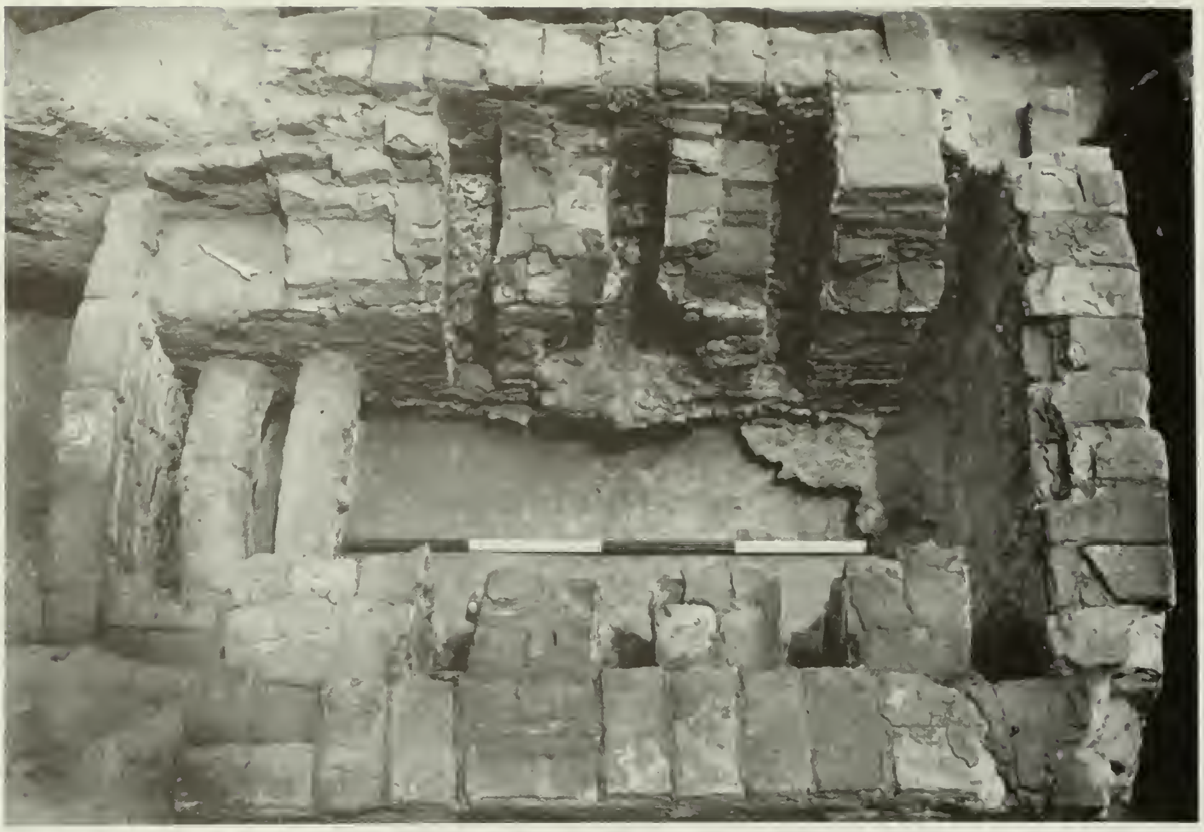


Figure 70. Small Kiln, closeup view. Looking east.

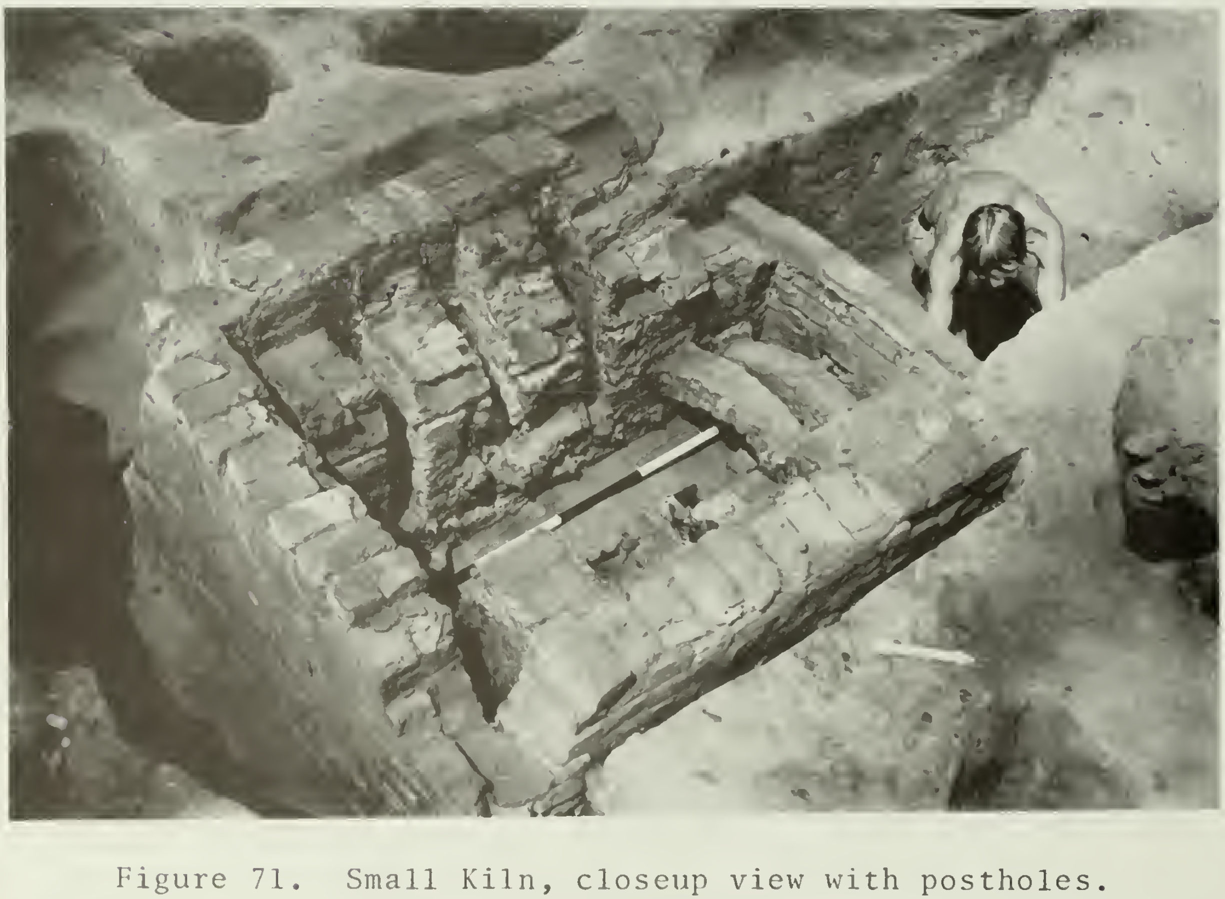


Figure 71. Small Kiln, closeup view with postholes. Looking northwest.

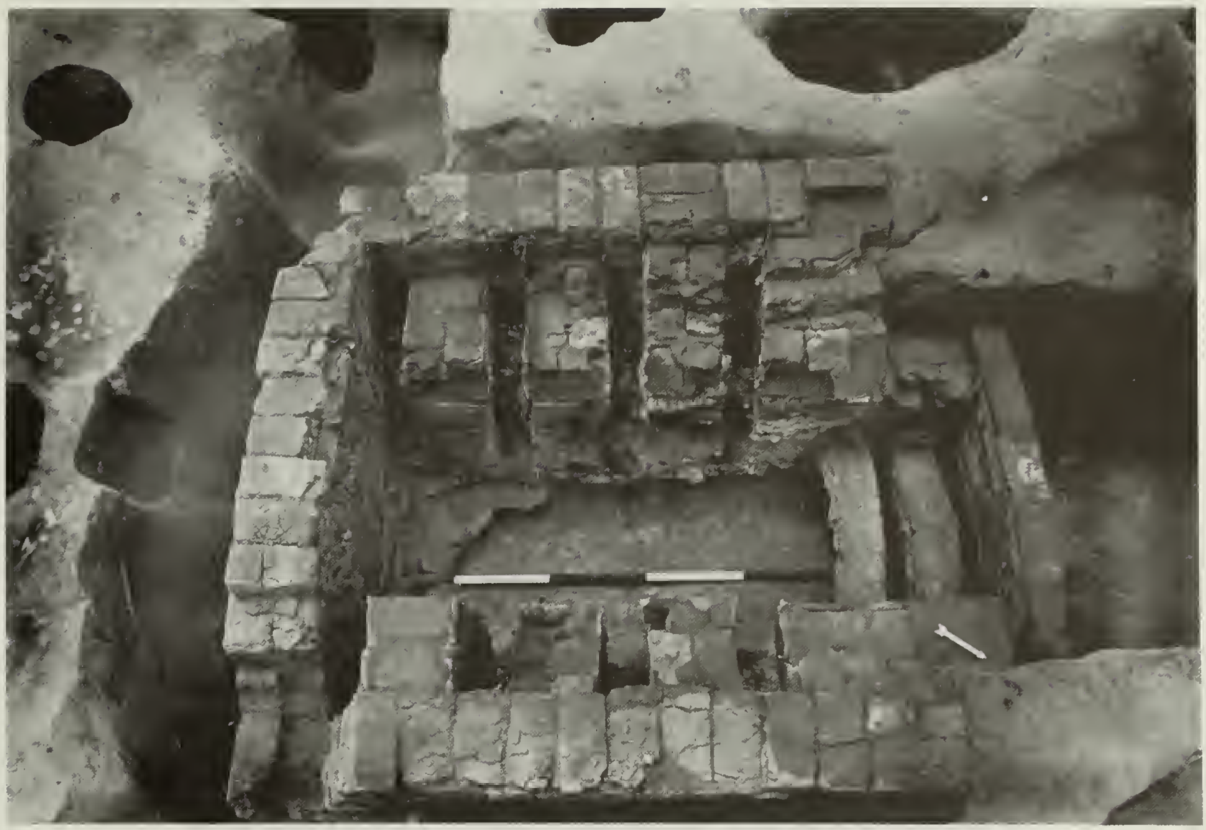


Figure 72. Small Kiln, closeup view with postholes. Looking west.

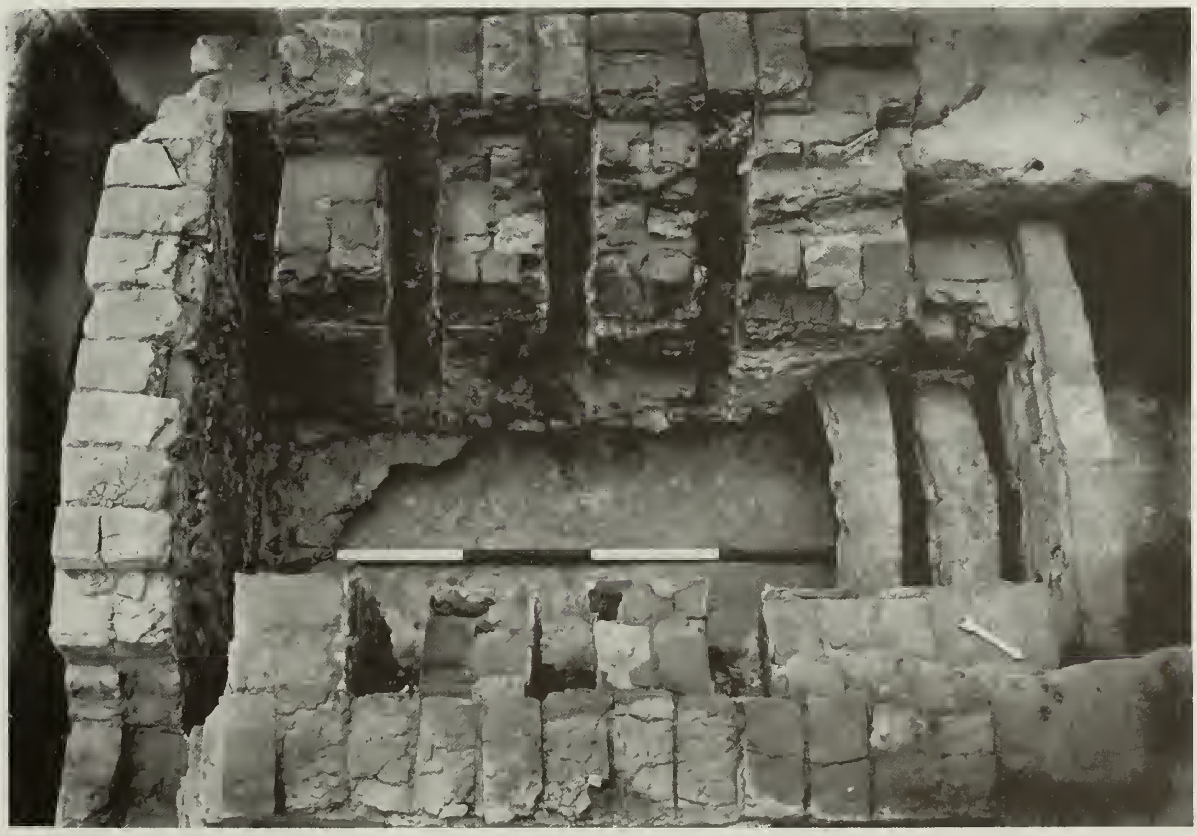


Figure 73. Small Kiln, closeup view. Looking west.

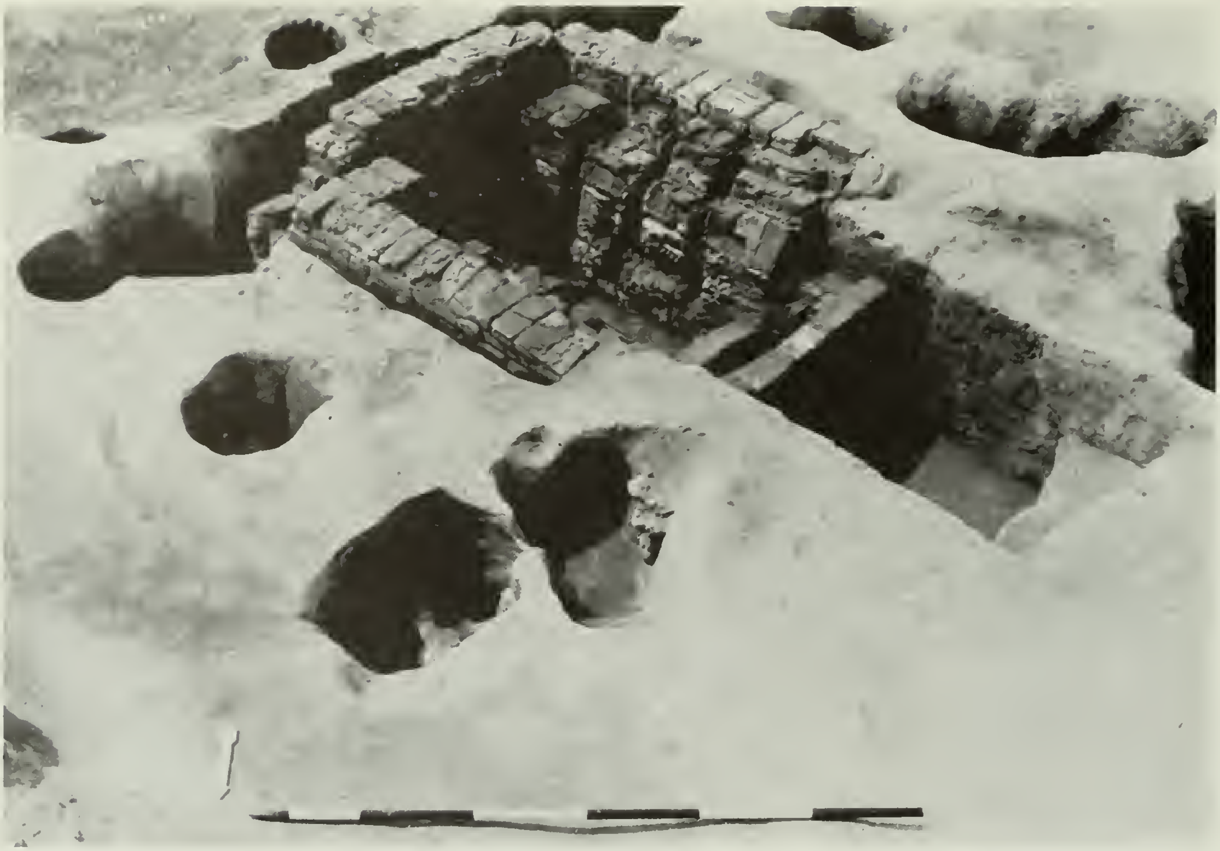


Figure 74. Small Kiln, closeup view with postholes and stoke hole pit. Looking southwest.

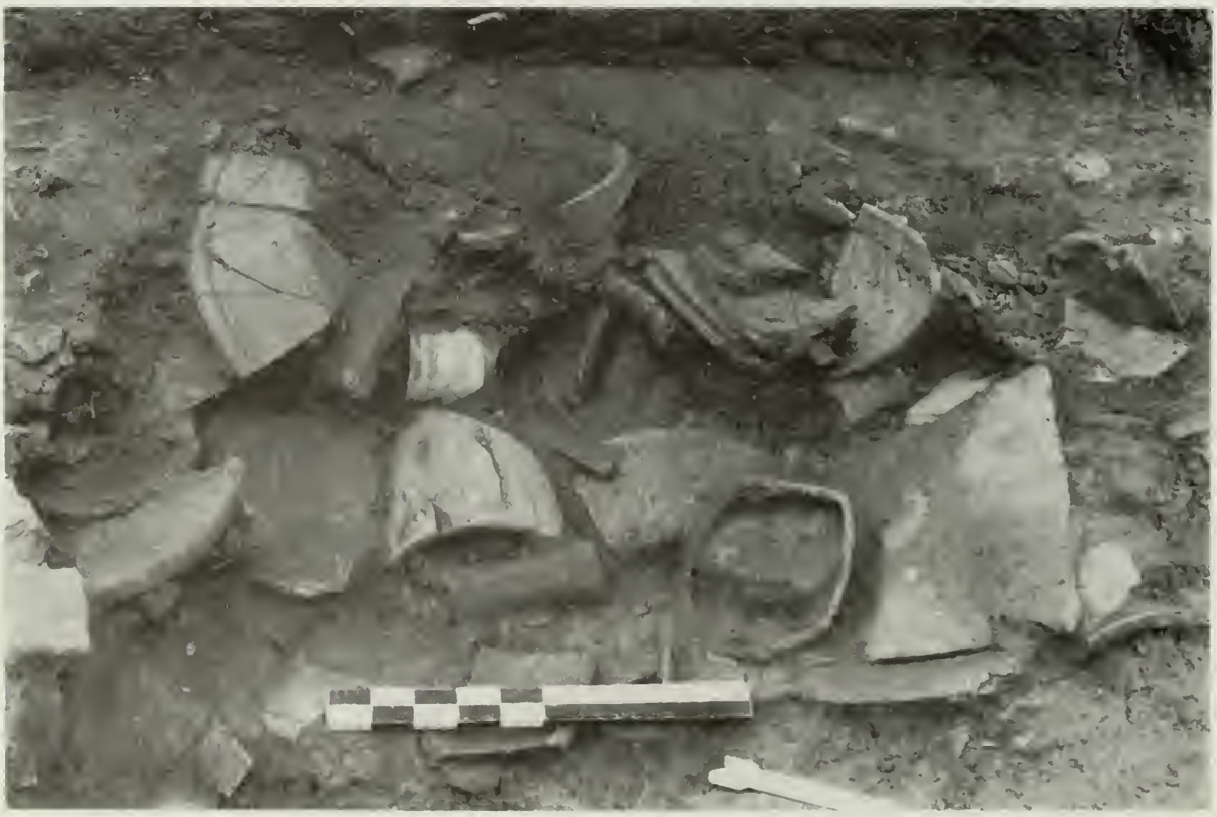


Figure 75. Small Kiln, example of pottery concentration.

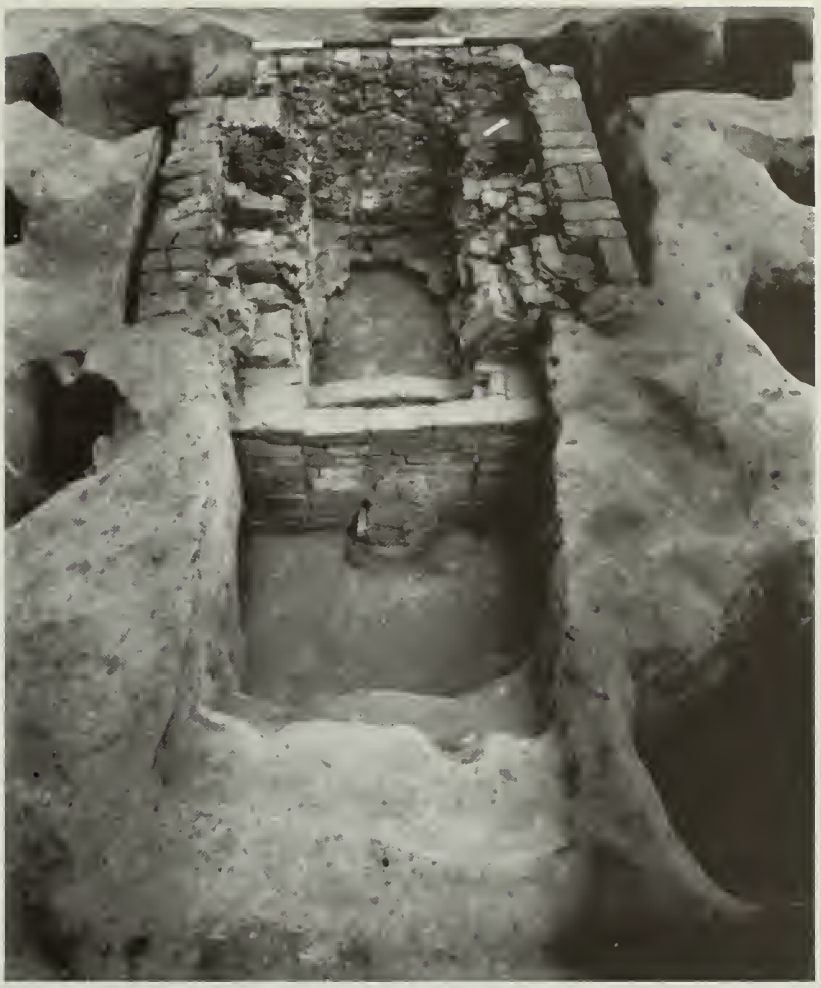


Figure 76. Small Kiln, closeup view of kiln and stoke hole pit, with surrounding postholes. Looking south.

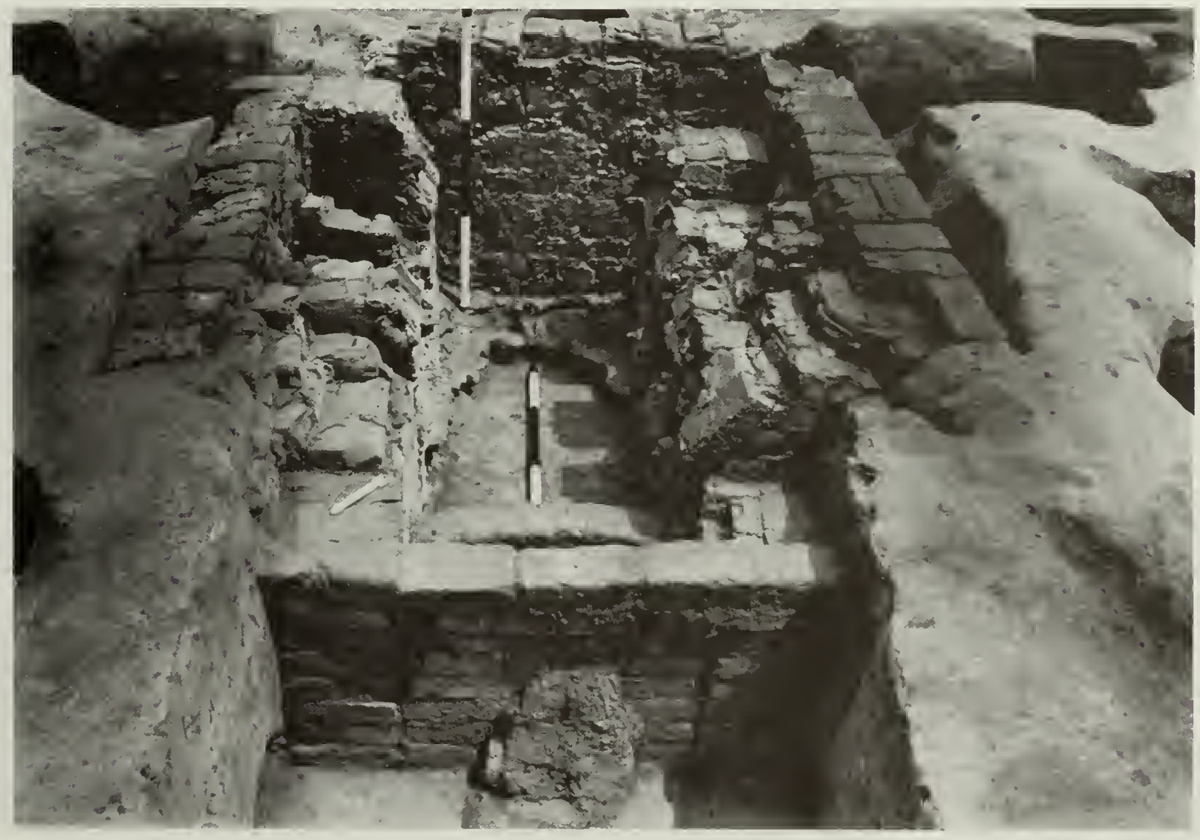


Figure 77. Small Kiln, closeup view. Looking south.

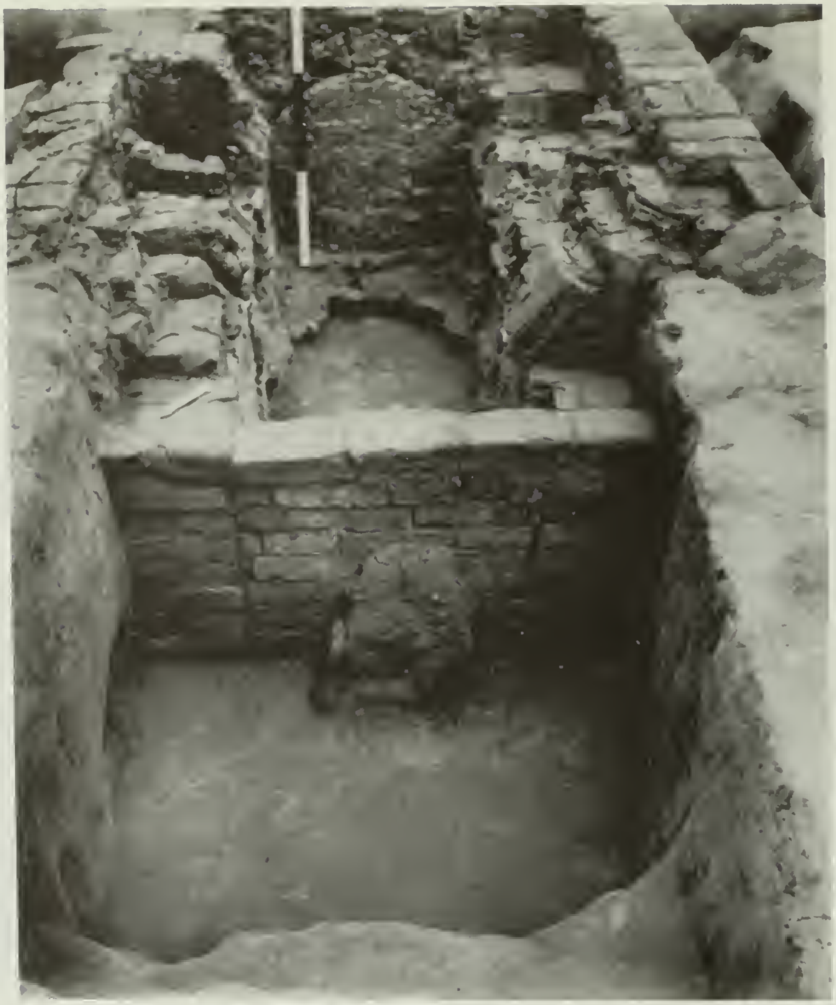


Figure 78. Small Kiln, closeup view of kiln and stoke hole pit. Looking south.

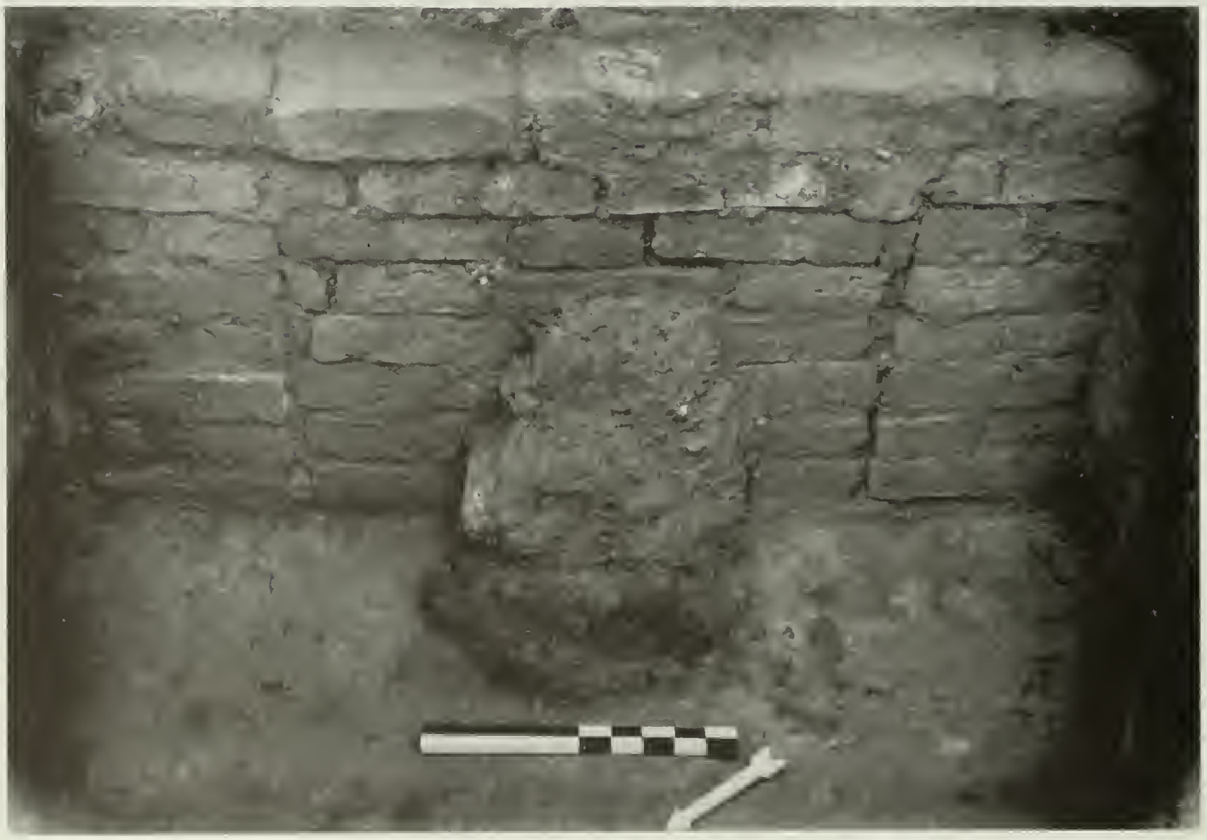


Figure 79. Small Kiln, closeup view of north wall of kiln and plugged stoke hole. Looking south.

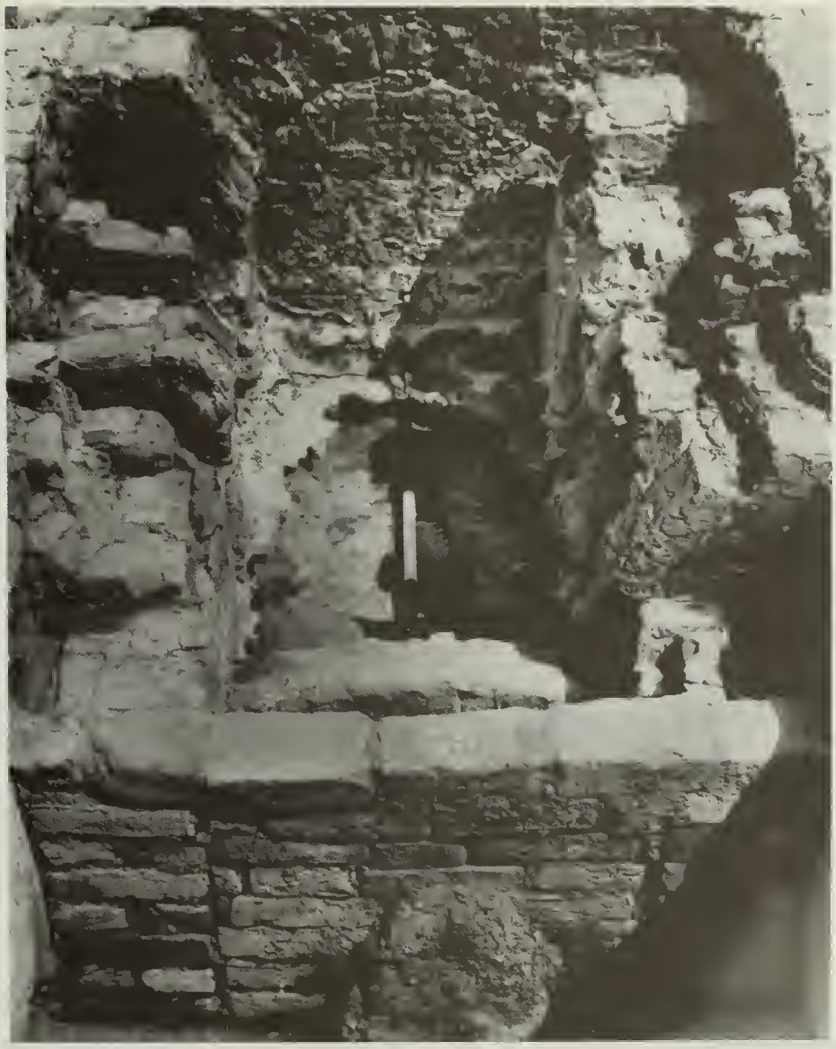


Figure 80. Small Kiln, closeup view. Looking south.

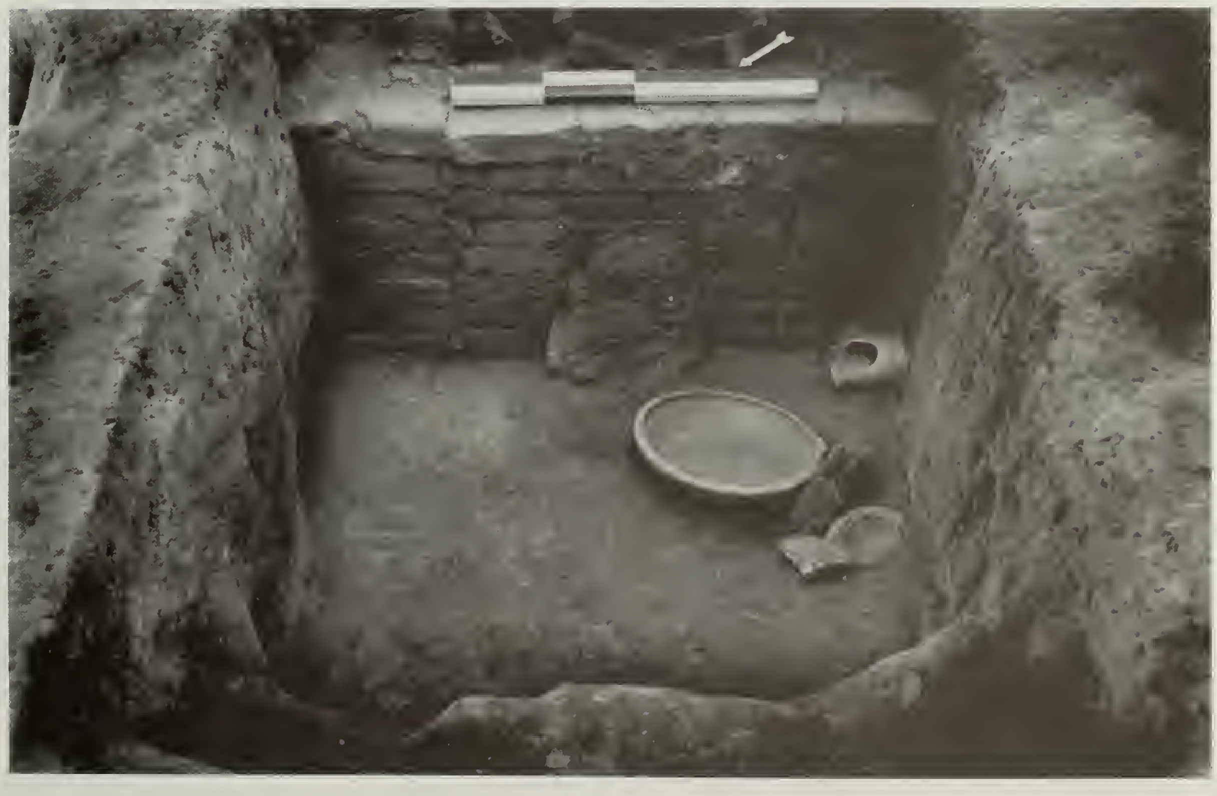


Figure 81. Small Kiln, *in situ* milk pan and mug on stoke hole pit floor. Looking south.

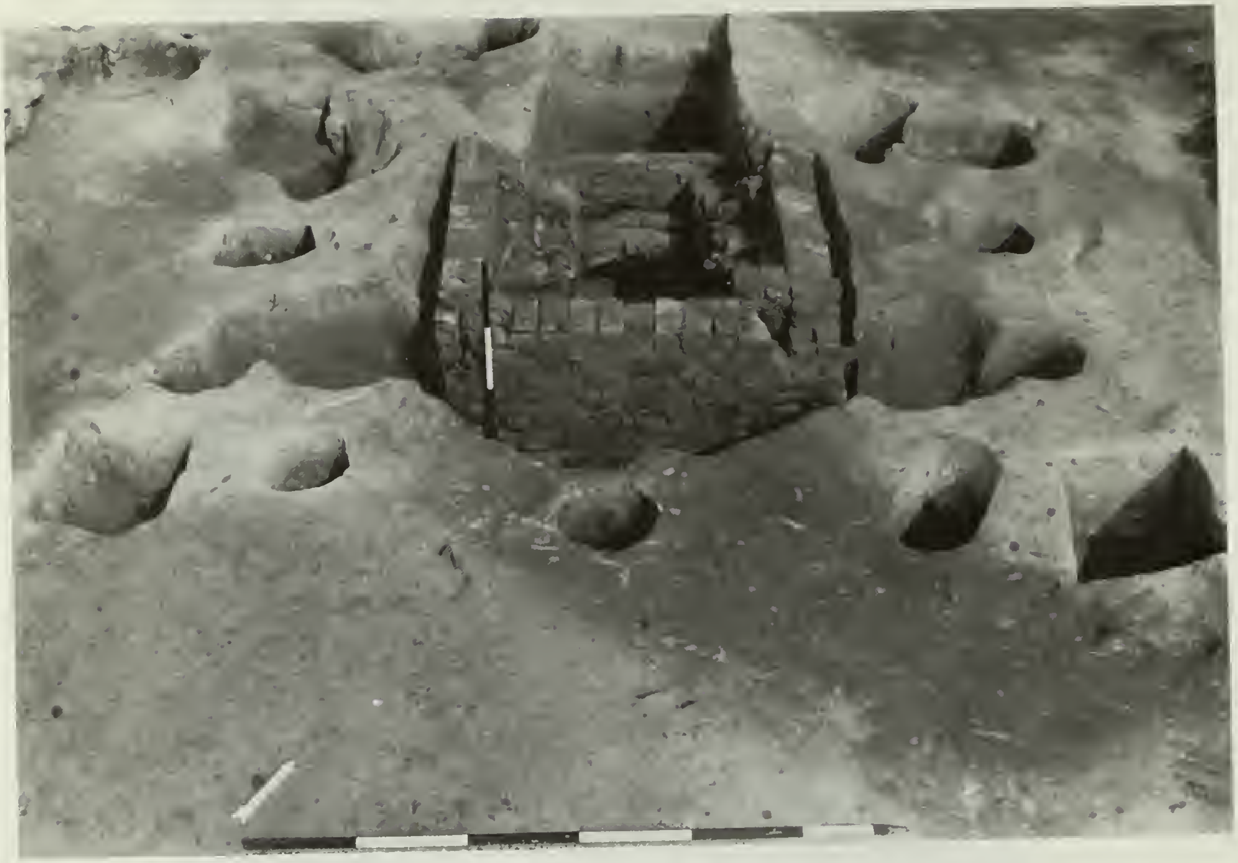


Figure 82. Small Kiln, kiln and surrounding postholes. Looking north.

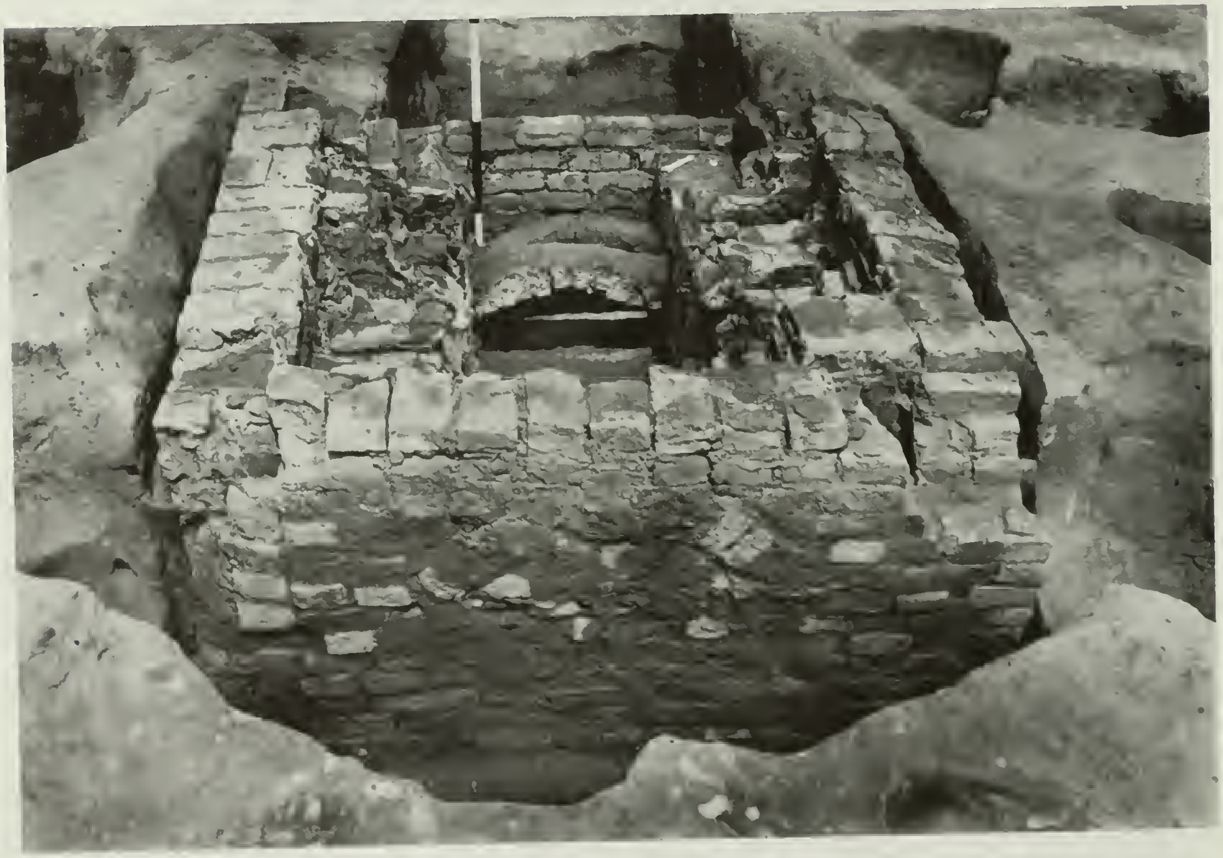


Figure 83. Small Kiln, closeup view of south wall. Note arch in wall. Looking north.

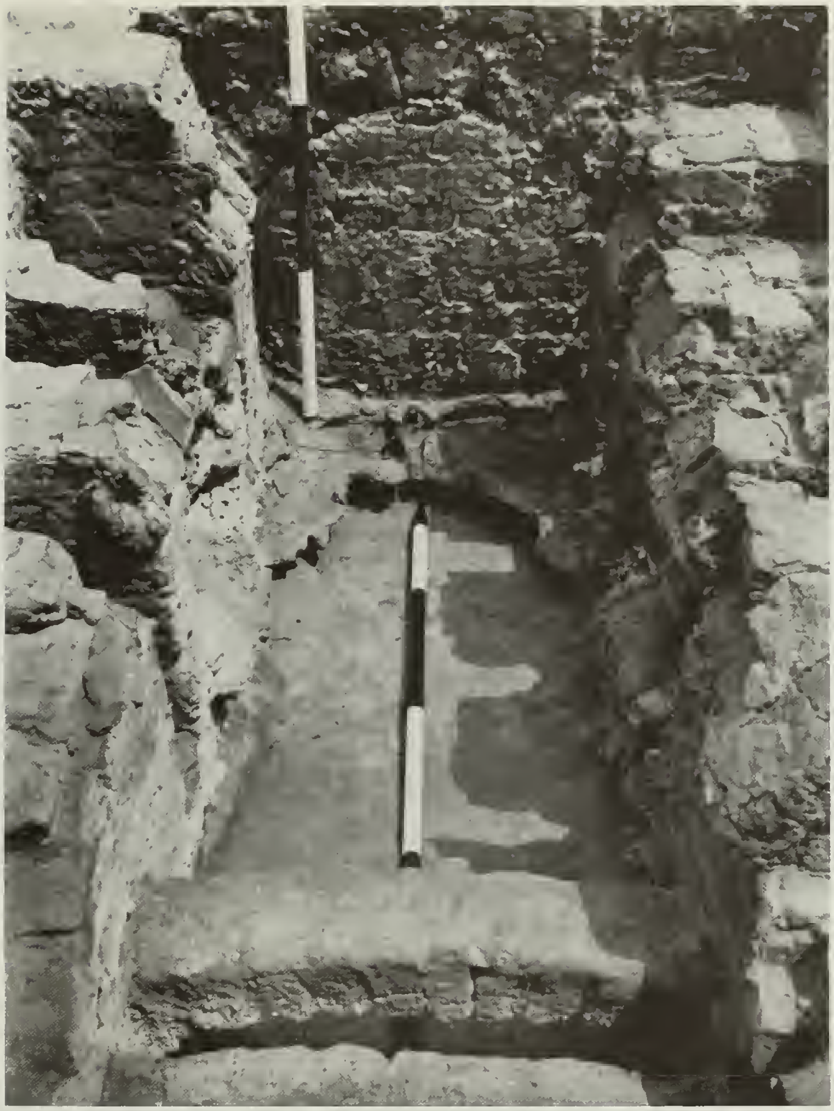


Figure 84. Small Kiln interior. Looking south.

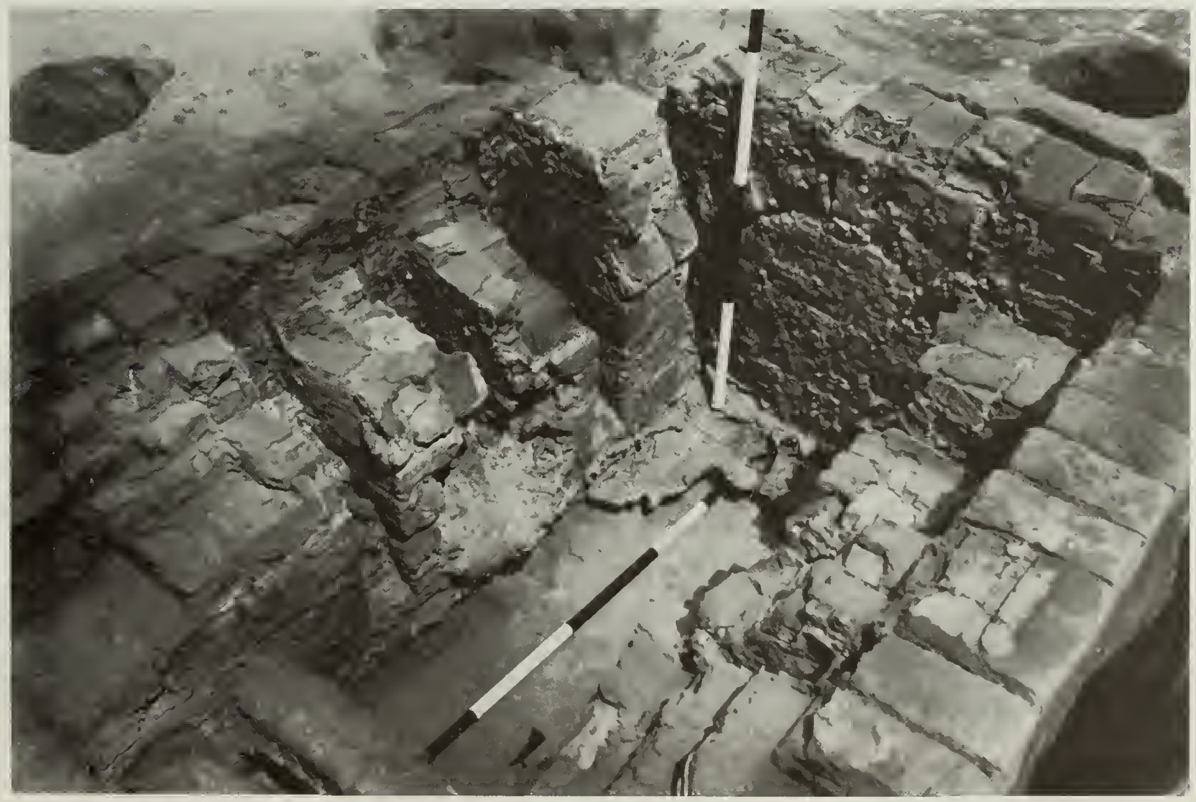


Figure 85. Small Kiln interior. Looking northwest.

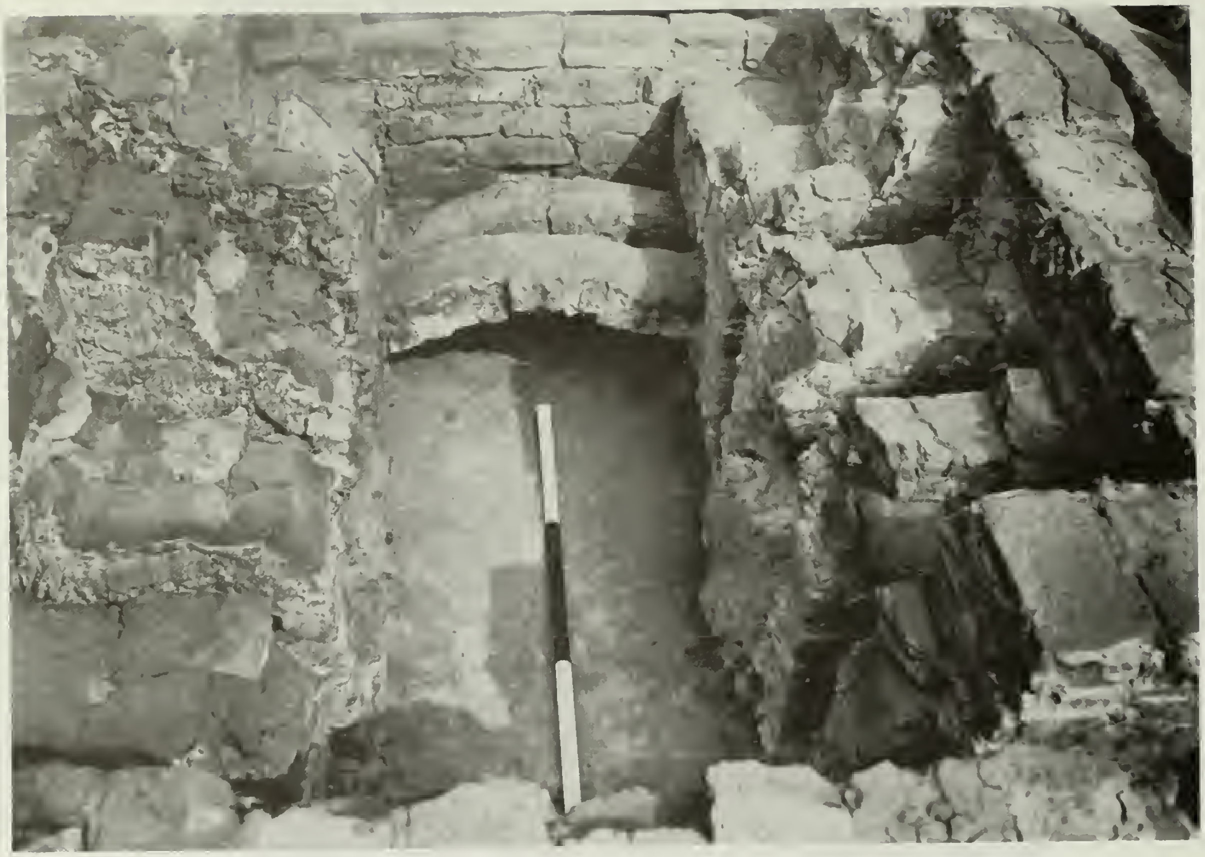


Figure 86. Small Kiln, interior of kiln with lower arches. Looking north.

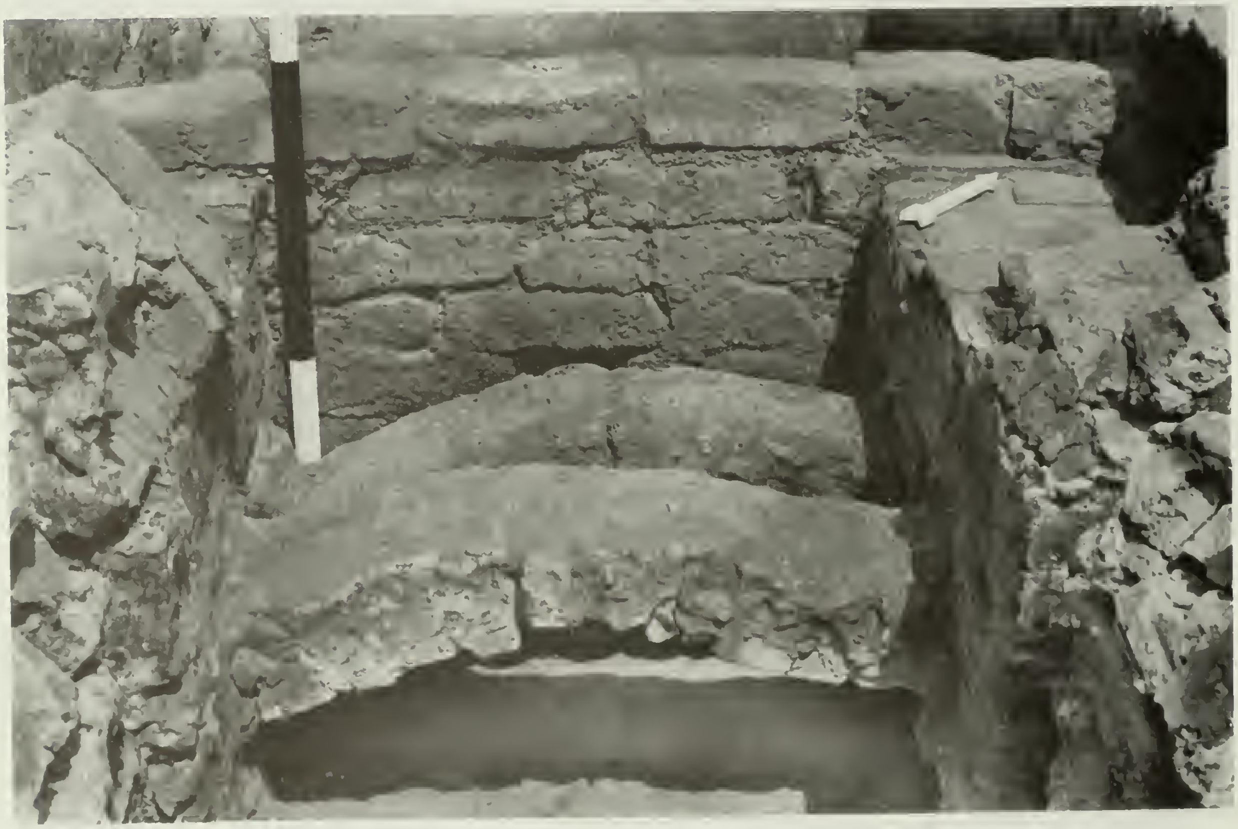


Figure 87. Small Kiln, lower arches and hobs of firebox. Looking north.

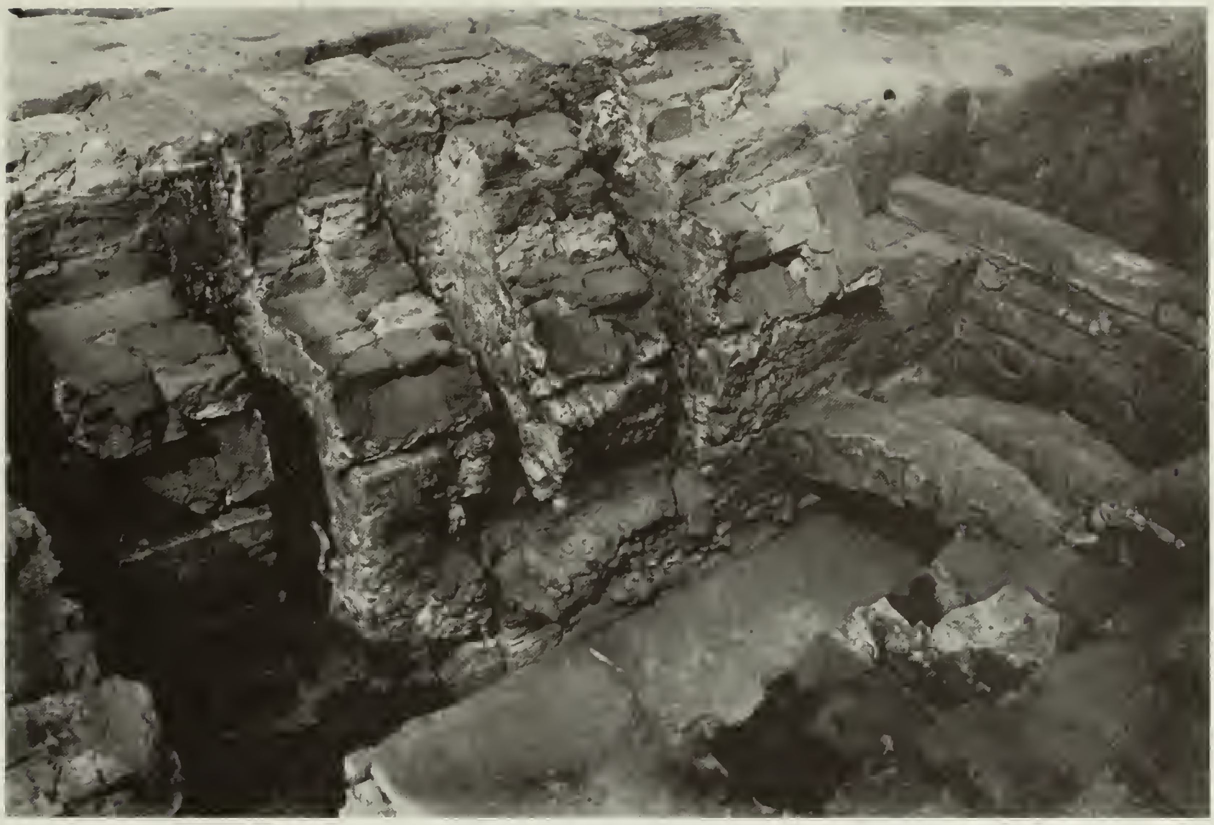


Figure 88. Small Kiln interior. Looking northwest.

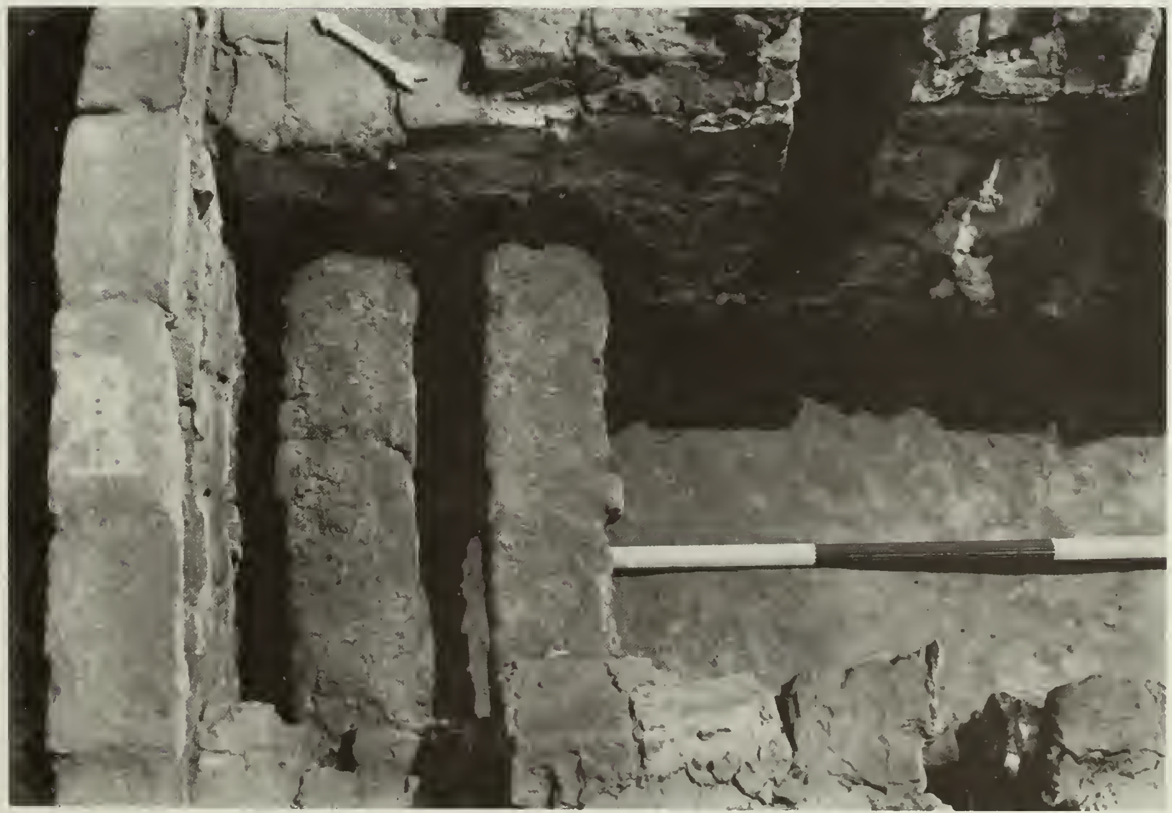


Figure 89. Small Kiln, plan view of lower arches and hobs (east hob is under north arrow). Looking east.

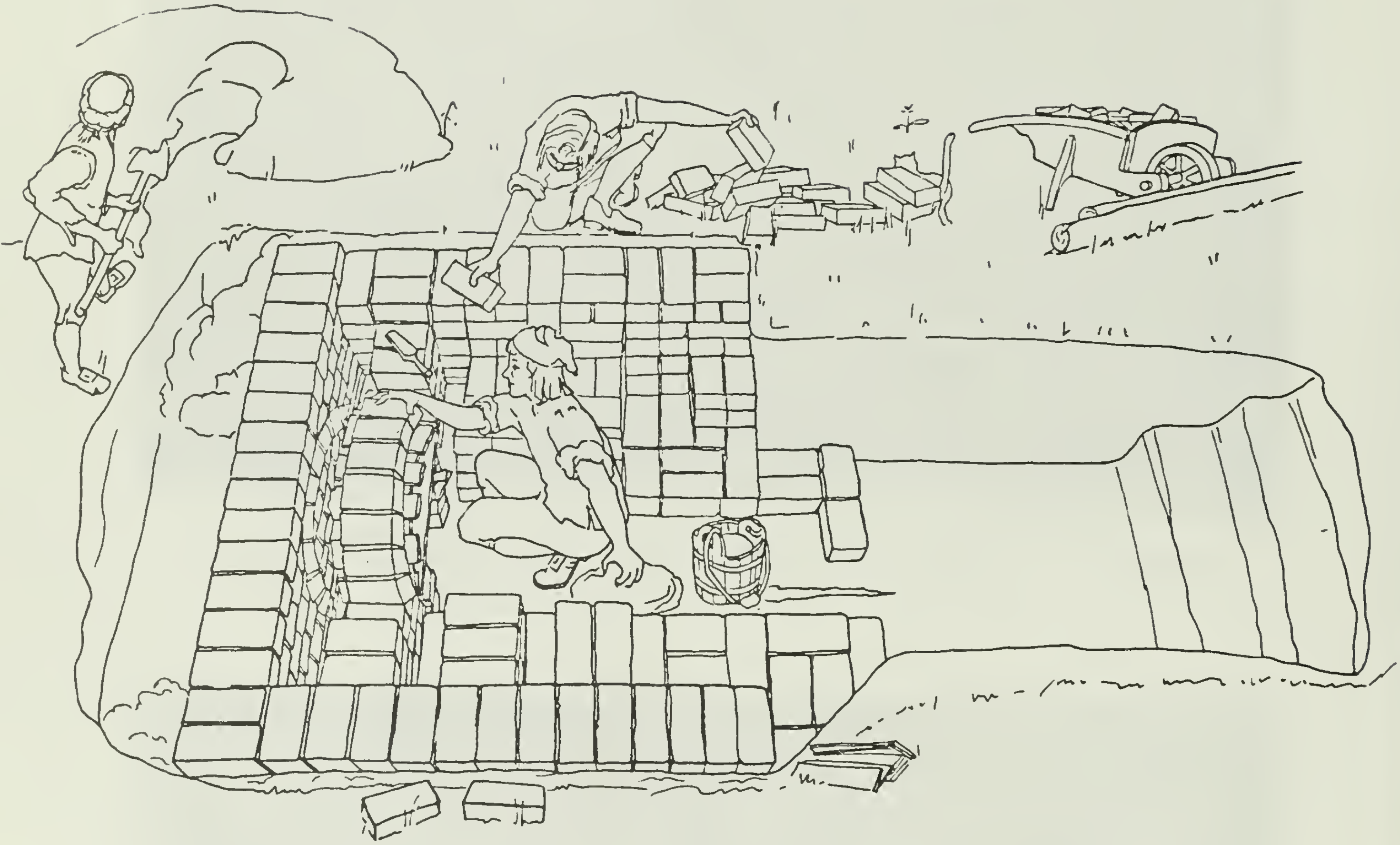
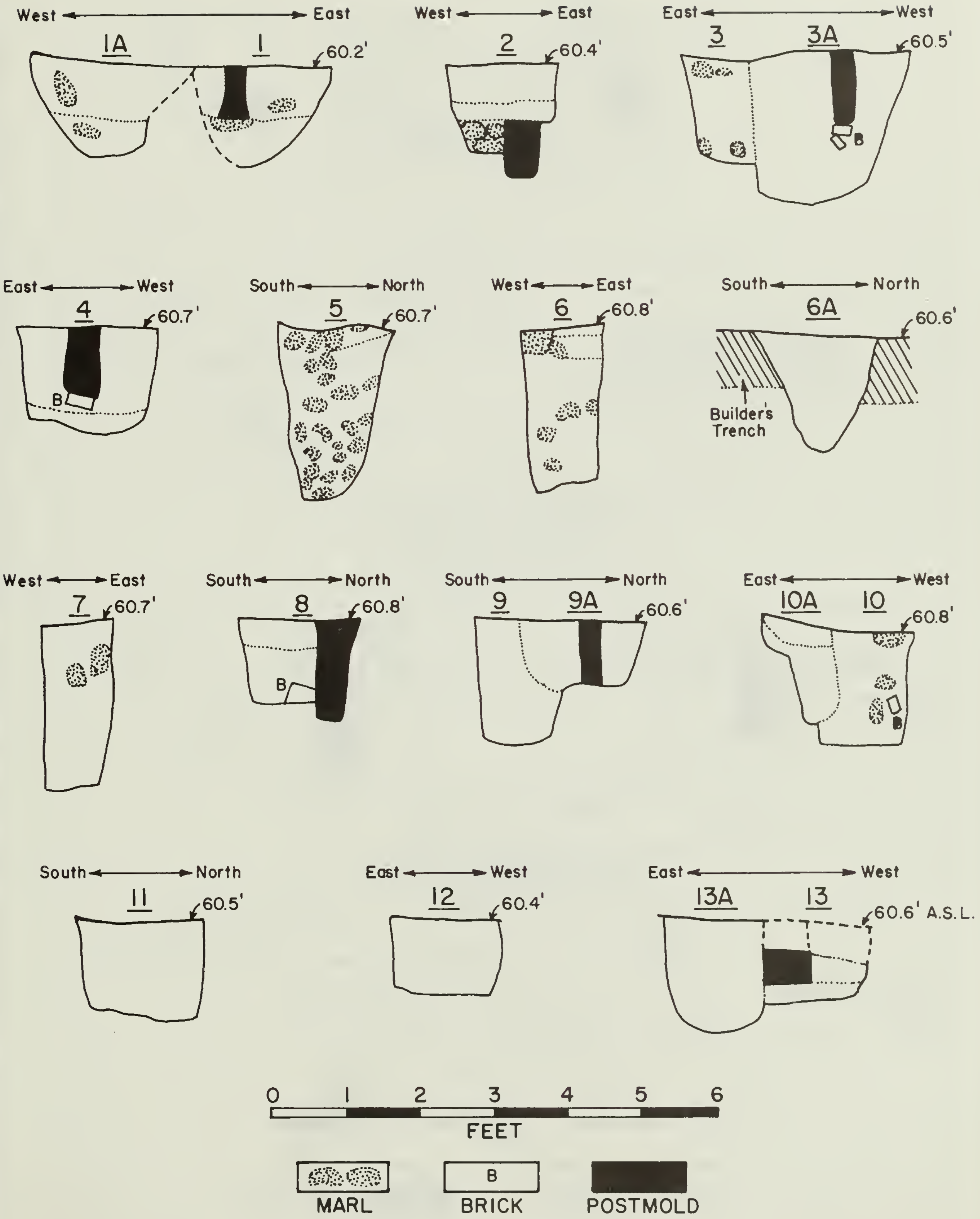


Figure 90. Building the Small Kiln.

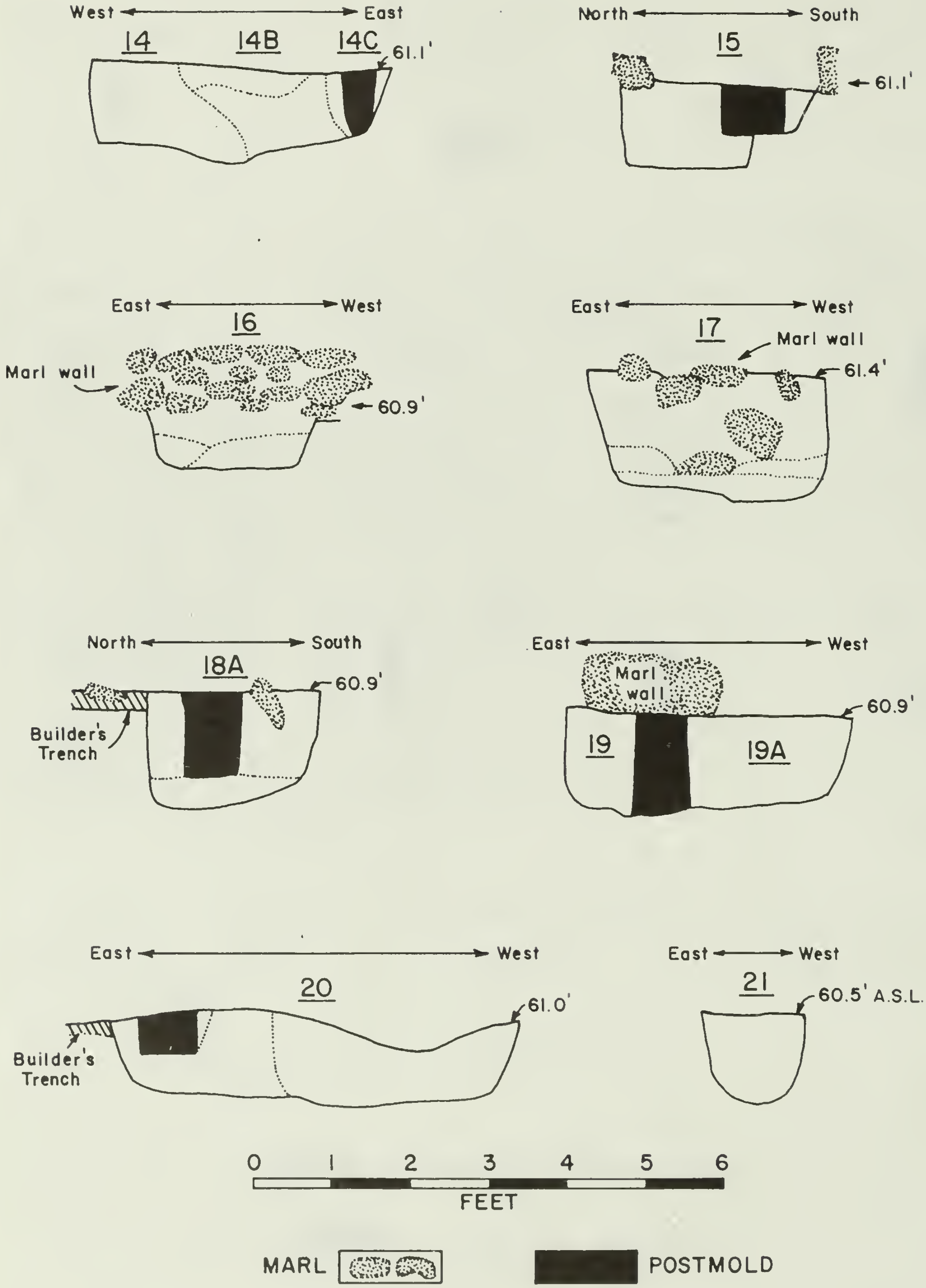


POSTHOLE - POSTMOLD SECTIONS

NUMBERS INDICATE POSTHOLES - SEE FIG. 53

NO. 316 - S. VAUGHN

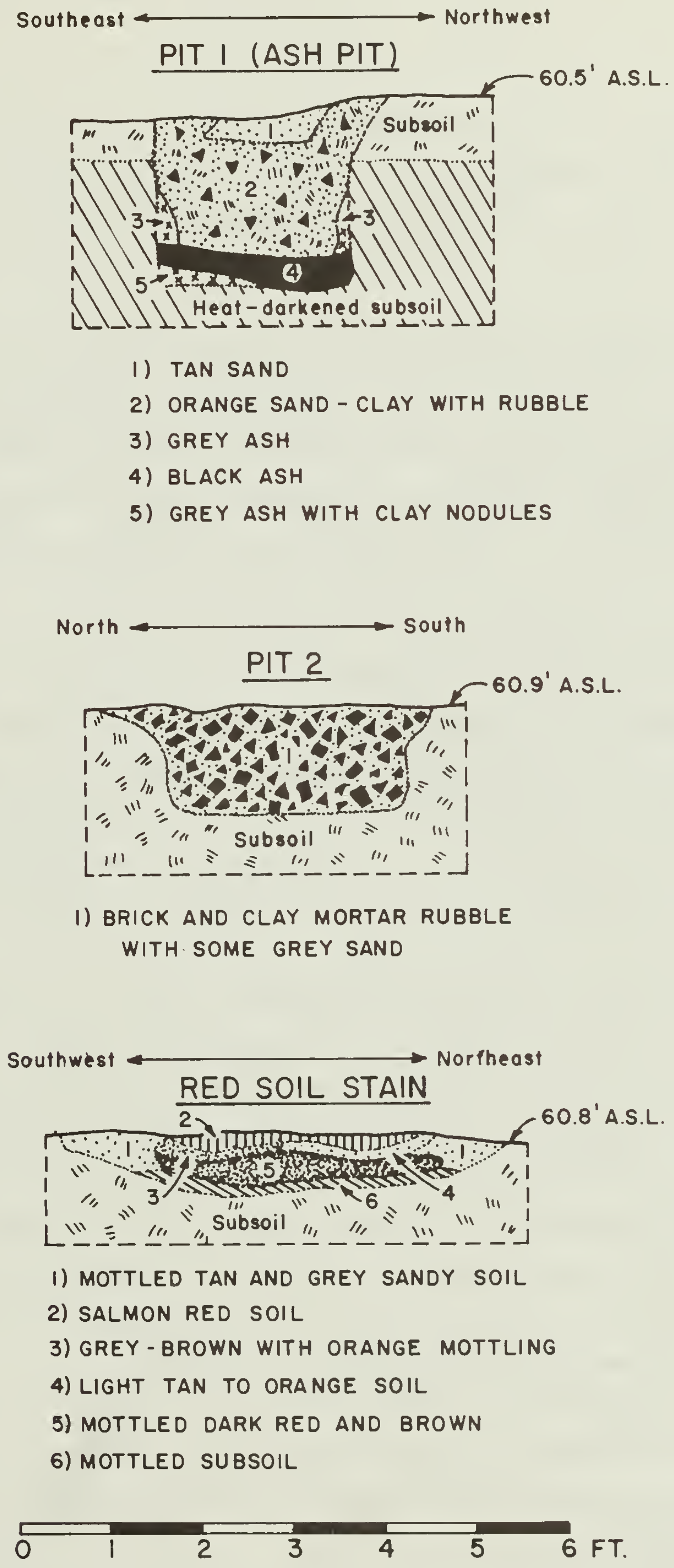
FIGURE 91



POSTHOLE - POSTMOLD SECTIONS
NUMBERS INDICATE POSTHOLES - SEE FIG. 53

NO. 317 - S. VAUGHN

FIGURE 92



PIT I (ASH PIT)

1) TAN SAND
2) ORANGE SAND - CLAY WITH RUBBLE
3) GREY ASH
4) BLACK ASH
5) GREY ASH WITH CLAY NODULES

PIT 2

1) BRICK AND CLAY MORTAR RUBBLE WITH SOME GREY SAND

RED SOIL STAIN

1) MOTTLED TAN AND GREY SANDY SOIL
2) SALMON RED SOIL
3) GREY - BROWN WITH ORANGE MOTTLING
4) LIGHT TAN TO ORANGE SOIL
5) MOTTLED DARK RED AND BROWN
6) MOTTLED SUBSOIL

SECTIONS OF PITS AND STAIN
(SEE FIG. 53)

SMALL KILN

NO. 318 - S. VAUGHN

FIGURE 93

CHAPTER 7

OPERATION OF THE KILNS

A kiln is basically a box constructed to contain heat. The Yorktown kilns were this and more, as their design was farily advanced for the early 18th C. Both Large and Small Kilns were of the updraft type, which meant that heat was drawn upwards from the firebox and flue into the pot chamber and out through holes in the roof. According to Roberts (1982: 16), updraft kilns have two major faults: 1). the updraft causes an extremely intense heat in the firebox.[1] In turn, this intense heat would greatly increase the draft so that flame and gases would be pulled through the pot chamber before most of its heat potential had been utilized. The results would be very inefficient use of fuel because of being burned so rapidly and also incomplete combustion within the pot chamber, which would have produced unevenly fired ware.

A more serious flaw of updraft kilns is that in order to reach maturing temperatures throughout the kiln, the kiln tends to be overfired on the bottom and underfired on the top. The overfiring, according to Roberts, causes the ware closest to the fireboxes to twist and become crushed due to the weight above.

The alternative to updraft kilns was the more sophisticated downdraft kilns, where the heat was forced to circulate within the kiln before escaping out the roof. These kilns did not really develop in England until the later 18th C.

It is presumed that both Yorktown kilns utilized wood as fuel. Numerous flecks of charcoal were found in the fill of both kilns. It is assumed that wood was plentiful in early 18th C. Tidewater Virginia.

Disregarding size, both Yorktown kilns were similar in design and construction. Both had heat chambers constructed below ground level. An integral part of each heat chamber was a series of arches and vents, which regulated heat flow and also formed the support for and floor of the above pot chamber. The floor level of the pot chamber was roughly at ground surface level. Curved roofs with slits or holes allowed heat and gases to escape from the pot chamber.

Both kilns had structural support systems to minimize effects of heating-cooling on the brick.

The kilns differed in regards to size and the arrangement of fireboxes. In regards to the latter, the Small Kiln was perhaps the more sophisticated of the two kilns.

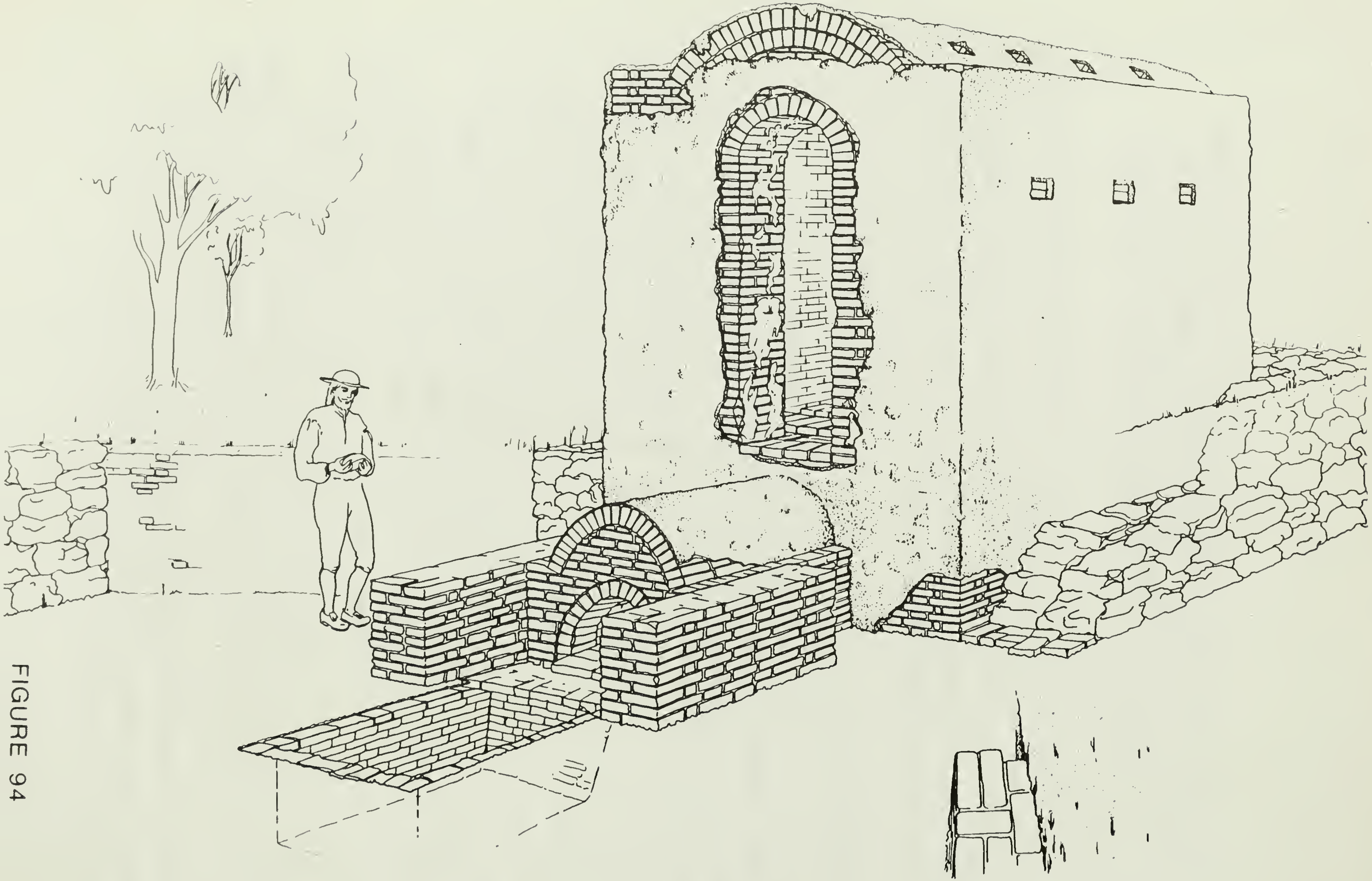
The Large Kiln

The Large Kiln was the major production unit at the factory. Although the pot chamber had been destroyed at sometime in the past, it is possible to estimate its size from the size and shape of the lower heat chamber. (Figure 94).

The stacking area of the Large Kiln has been estimated to be 310 cubic feet, a good sized kiln. In downdraft kilns, the height of the pot chamber is almost always equal to the width in order to provide an even distribution of heat. In updraft kilns, however, since heat rises up to the roof, height is increased 1-1/2 times more than the ideal cube shape. Consequently, the volume of a kiln is calculated in this way: length times width times height, height being 1-1/2 times the width. The Large Kiln at Yorktown: 7 ft. (length) x 5-1/2 ft. (width) x 1-1/2 (width) = height of 8 ft. = 310 cubic feet.

The Large Kiln was fired by shoving logs through the small arched firemouth or stoke hole located on the north side of the firebox. The potter stood in the stoke hole pit to do this, making the firemouth at waist level. the pieces of wood used could be as long as the firebox - c.4.0 ft. The firebox had an arched top, supported and protected by adjacent 1.1 ft. wide brick retaining walls. There is no evidence that another loading door for fuel was present in this kiln.

FIGURE 94



RECONSTRUCTION OF LARGE KILN

Man is 5′6″ in height

As mentioned above, the stoke hole pit functioned as a place where the stoker could stand to conveniently load fuel into the firemouth and to stoke the fire. Fuel could be stacked within reach of the stoker, ready for use.

The stoke hole pit apparently also served as a repository for ash at certain times. As described earlier in the report, when found the stoke hole pit was filled with 19 layers of ash, charcoal, kiln furniture, etc. Ash may have been scraped out of the firebox into the stoke hole pit as a temporary repository, then removed later. That this occurred several times is suggested by the evidence of excavation beneath the brick walls of the stoke hole pit, as also explained earlier.

It is also possible, but improbable, that embers may have been removed from the firebox during firing in order to control temperature. Roberts (1982: 31) states that forty percent of the heat produced in a wood kiln comes from the burning embers and therfore he feels it is highly unlikely that a potter would remove these embers from a kiln. Cooling the kiln could also have been achieved by opening more holes in the arched roof of the kiln, by allowing excess heat to escape.

The entrance to the pot chamber was undoubtedly on the north side of the kiln, as this side faced both the Workshop Room and Workshop Building. It is probable that a moveable wooden stairway somehow was propped over the firebox area in order to provide access to the pot chamber doorway.

Many mysteries remain concerning the operation of the Large Kiln. For example, what was the function of the marl wall construction which surrounds three sides of the kiln? One suggestion is that the marl wall served as a bracing system against the stress and strain of the brick. It is not known how high this marl extended. If it extended the full height of the kiln for bracing and insulation purposes, one has a difficult time explaining the 'corridor' on the west side of the kiln. During firing, one would think that it would have been much too hot to even go into the 'corridor'. Yet a paved corridor area does exist.

Probably the marl wall terminated at ground level, as Figure 94 shows. In this capacity, the marl served as below-ground insulation for the kiln. A bracing system made of wood may have been used, as has been suggested for the Small Kiln, but no archaeological evidence was found for such a system, with the exception of two possible postholes on the west side of the kiln. The east side of the kiln was too disturbed to reveal any traces of postholes. None were noticeable on the south side.

Antoher problem is the point where the two angling brick walls articulated with the kiln. Once can only speculate that these brick walls once joined the bricks which are visible beneath the outer marl wall on the north side of the kiln. The function of the angling walls is also difficult to deal with. It seems most probable that they angle inwards toward the firebox in order to direct air toward the fire.

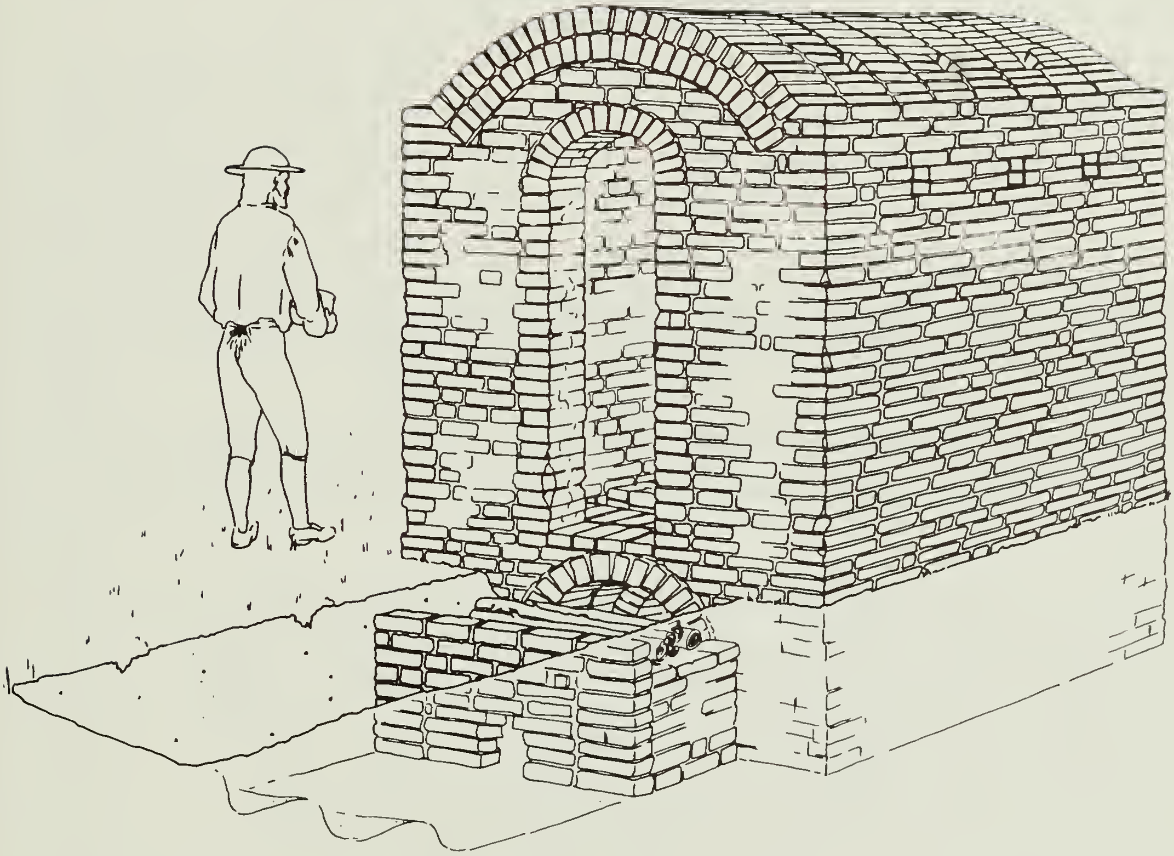
The roof of the large kiln was arched and contained slots or holes for heat-smoke escape. In appearance, the roof must have looked like the one drawn by Piccolpasso (1548).

Small Kiln

As described previously, the Small Kiln was identical in basic design to the Large Kiln: both were updraft kilns; each had a lower heat chamber constructured basically of surrounding brick walls and arches which spanned a main flue; with a pot chamber above. The two kilns differed in size and in firebox design. Rather than having an extended firebox and stoke hole pit, the Small Kiln had a simple stoke hole pit with earthen steps leading down to the firebox. (Figure 95).

The pot chamber walls rested upon the brick of the heat chamber below. The pot chamber had its own door for stacking, probably located on the north wall above the firebox. This door would be bricked up before firing. The floor of the pot chamber was supported by the four arches of the lower chamber.

The Small Kiln had a capacity roughly one-quarter the size



RECONSTRUCTION OF SMALL KILN

Man is 5′6 in height

FIGURE 95

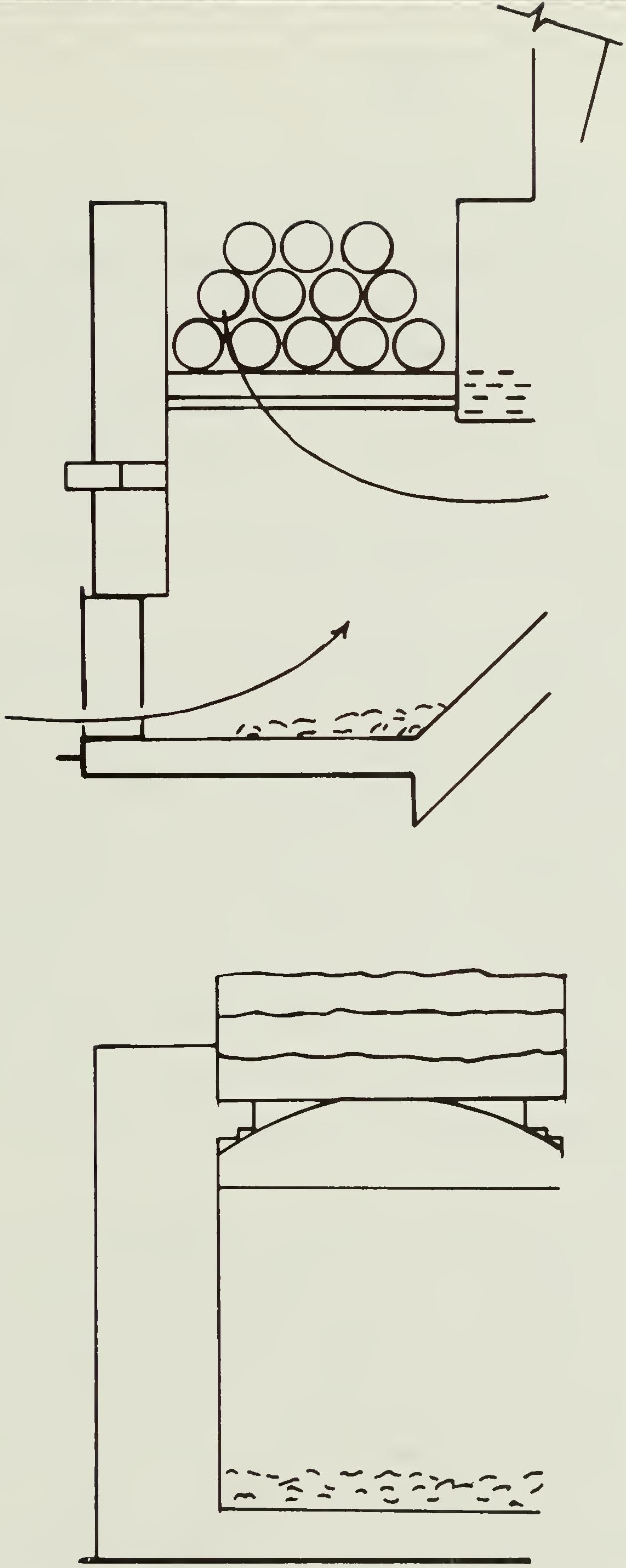
of the Large Kiln. By once again using the formular L x W x H, H being 1-1/2 times W as we are dealing with an updraft kiln, the figures used are as follows: 4L x 4W x 6H = 80 cubic feet. Thus, the Large Kiln was approximately four times as large as the Small Kiln.

The firebox of the Small Kiln is formed by a shorter and narrower projection of the kiln's north side. Two brick shelves or hobs, each one brick wide, are situated on either side of the main flue. Located slightly below these shelves are two arches, immediately below which is a stoke hole. The brick hobs supported the ends of the logs which served as fuel. Air could easily pass beneath the burning logs and combustion could take place in the firebox.

In order to more fully understand this firebox design, reference will be made to a description of the firebox named after Emile Bourry:

> "Blocks of wood may also be burnt in fireplace with gratings [as in Figure 96]. The hearth should be extended beyond the front of the kiln, and the wood charged through an upper passage, the dome of which is placed immediately underneath the kiln and causes the goods to be burned. The air enters by a lower passage which forms an ashpit and leads into the upper passage through openings arranged regularly in the dome of it, but not opposite those of the first one. A part of the fuel falls into this ashpit and is consumed there while heating the air. This arrangement is fully suited for updraught kilns and can easily be modified when necessary. For the production of high temperatures, various patterns of fireboxes were used. The type represented [see Fig. 96] produces good results provided all the logs are of the same length. These are piled in the upper opening of the firebox and rest on two brickwork projections [hobs]. The combustion takes place by the air passing between the logs, the flames following the direction shown by the arrows. The embers which fall to the bottom of the fireplace help the burning, owing to the air entering through the ashpit door [stoke hole]".[2]

The above quotation basically describes heat production for the Small Kiln. Wood is raised above the hearth to insure



THE BOURRY FIREBOX

FIGURE 96

complete combustion. The hob firebox is loaded so that logs lie at right angles to the draft, with their ends resting on the two hobs. The primary air enters at or near the top of the firebox and flames travel downward and enter the firebox arch. Embers would keep falling into the area below, but it will be remembered that there is an intact secondary grate formed by two smaller arches below the hob on the north side of the kiln. This grate catches and suspends any partially burnt wood for more complete combustion.

The stoke hole, situated within the north brick wall, measured 0.9 ft. in height. This opening probably functioned more as an air intake port to aid in the complete combustion of fuel. Known to potters as a secondary air port (primary air being where the air first mixes with the flames at the hobs), its function was to burn gases which were liberated at the level of the hob. If no secondary air was admitted, the firebox would act as a gas producer, and the valuable gases emitted would be unable to burn where needed (in the flue channel below the kiln). The unburnt surplus gas would pass through the kiln and be wasted in the form of heavy black smoke and flame at the top of the kiln (Roberts 1982: 45-46).

The firebox for the Small Kiln was really quite sophisticated for its time. Its design lessens the possibility of back fatigue and scorching of the stoker. Logs were piled on the hobs at waist level and the logs were gravity fed into the firebox.

As mentioned in previous chapters, numerous postholes were found immediately around the Small Kiln. The function of these posts probably was as a system of buttresses used to support the thrust of the roof arch and also to prevent cracking of the kiln, due to the effects of the heating-cooling cycle. Green wood was undoubtedly utilized to lessen combustion or charring. Periodically these beams would have to be replaced, as is borne out by the posthole evidence.

FOOTNOTES

1. Roberts, Thomas, The Kilns of Yorktown, (unpublished paper), New York State College of Ceramics, Alfred University, 1982.

2. Quoted in Roberts, 1982, pp. 41-44.

CHAPTER 8

COMPARISONS WITH EUROPEAN KILNS

The Yorktown kilns were built by potters who had knowledge of or experience in the tin glazed earthenware industry in England. The Large and Small Kilns of Yorktown greatly resemble in design a series of late 17th - early 18th C. Kilns recently excavated in the Lambeth-Southwark and Fulham areas of London. Excavations of kilns at Norfolk House[1], Montague Close[2], Vauxhall[3], and Fulham[4] have revealed evidence of rectangular structures in which tin glazed earthenwares and stonewares had been fired.

The use of rectangular kilns for tin glazing goes back at least to the time of Cipriano Piccolpasso (1548).[5] His rectangular kiln also resembles the Yorktown kilns in basic design - a lower heat chamber with a main flue and arches, above which is a pot chamber (Figures 97-100).

It seems probable that the use of tin glaze type rectangular kilns for stoneware manufacture began in the 17th C. or before. John Dwight of Fulham used such a kiln for stoneware manufacture in the late 17th C.[6] Rectangular kilns were gradually supplanted by circular bottle kilns in the 18th C., as the Vauxhall evidence indicates. However, in other areas, stoneware was also made in oval kilns, as the evidence from Woolwich indicates.[7]

The Yorktown kilns evidently are linked to this same English tin glazing to stoneware tradition. The Yorktown potter(s) may have come from the London area and probably had worked in a stoneware or tin glazed pottery such as those operating in the Lambeth-Fulham areas.

Perhaps this linkage with tin glazed pottery explains the burial of the blue on white tin glazed cup beneath the AC 1720 porringer.

To date, Kilns 10 and 11 from Vauxhall provide the closest link to the Yorktown kilns. These kilns, the heat chambers of which were built below ground level, are back-to-back kilns and each have narrow spaced heat chamber arches.[8] (Figure 101) Each kiln has five or six arches, a central flue with side vents, and both kilns show heavy salt glazing. The pot chambers probably measured c.7 ft. x 7-1/2 ft. internally, which compares with the 7 ft. by 5-1/2 ft. Large Kiln measurements. A fireplace and stokehole are present at each end of Kilns 10 and 11.

Except for the form of the exterior buttressing [marl walls may have served the same function at Yorktown], Kilns 10 and 11 are nearly identical to the Large Kiln and similar in basic design to the Small Kiln. Based on the Vauxhall evidence, there is no doubt that the prototype for the Yorktown rectangular kilns was English.

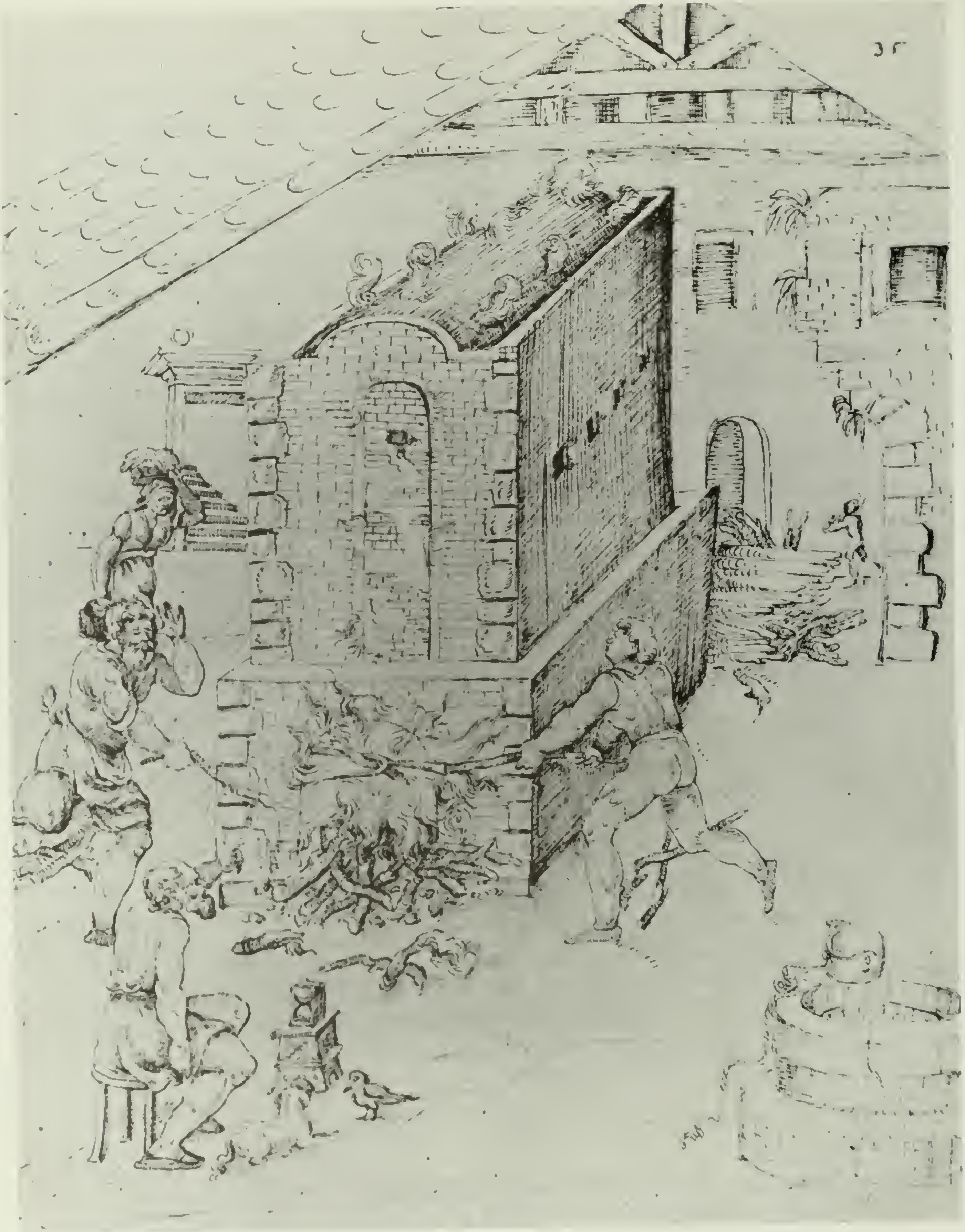


Figure 97. Firing the rectangular kiln of Cipriano Piccolpasso (1548).

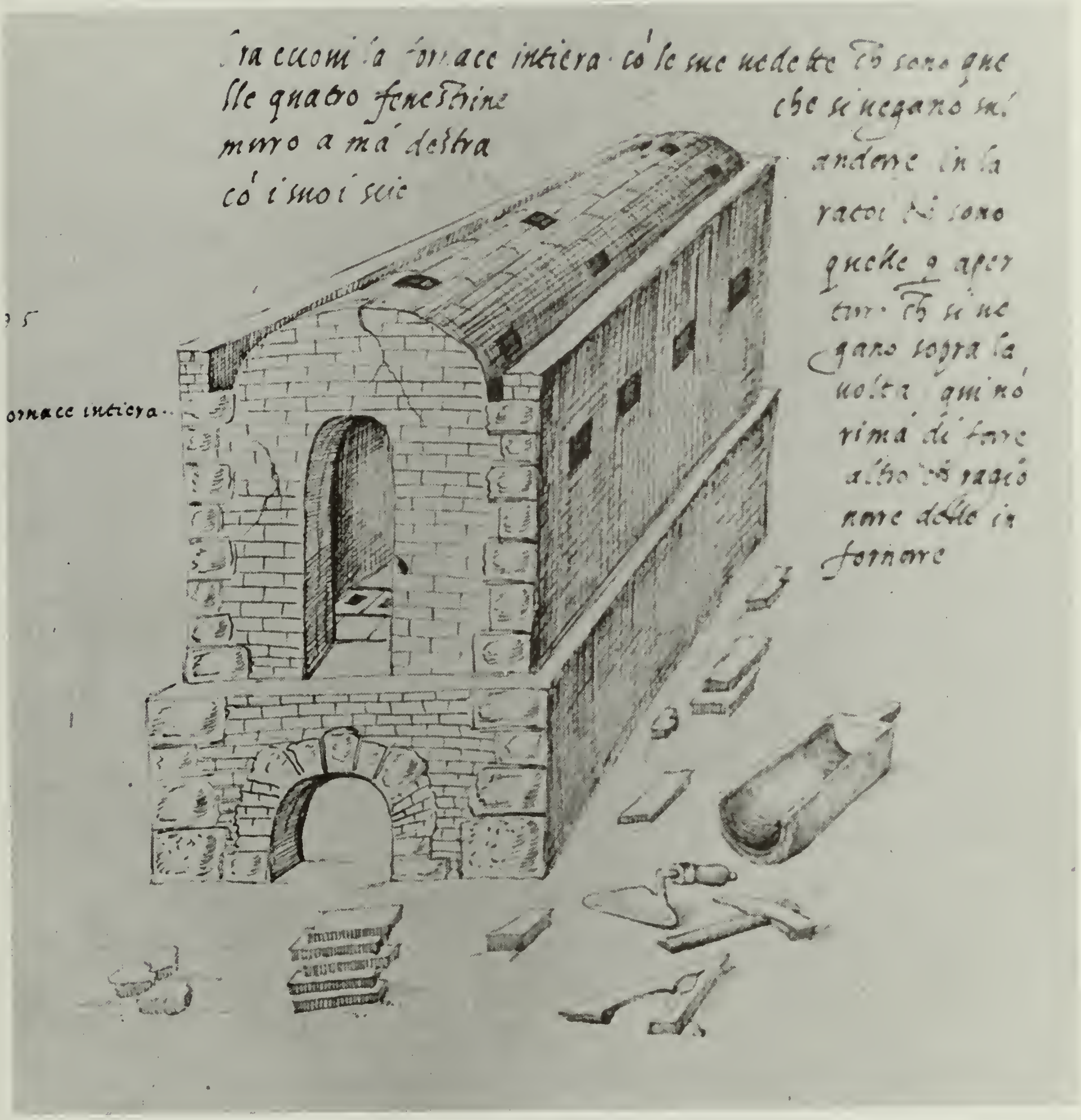
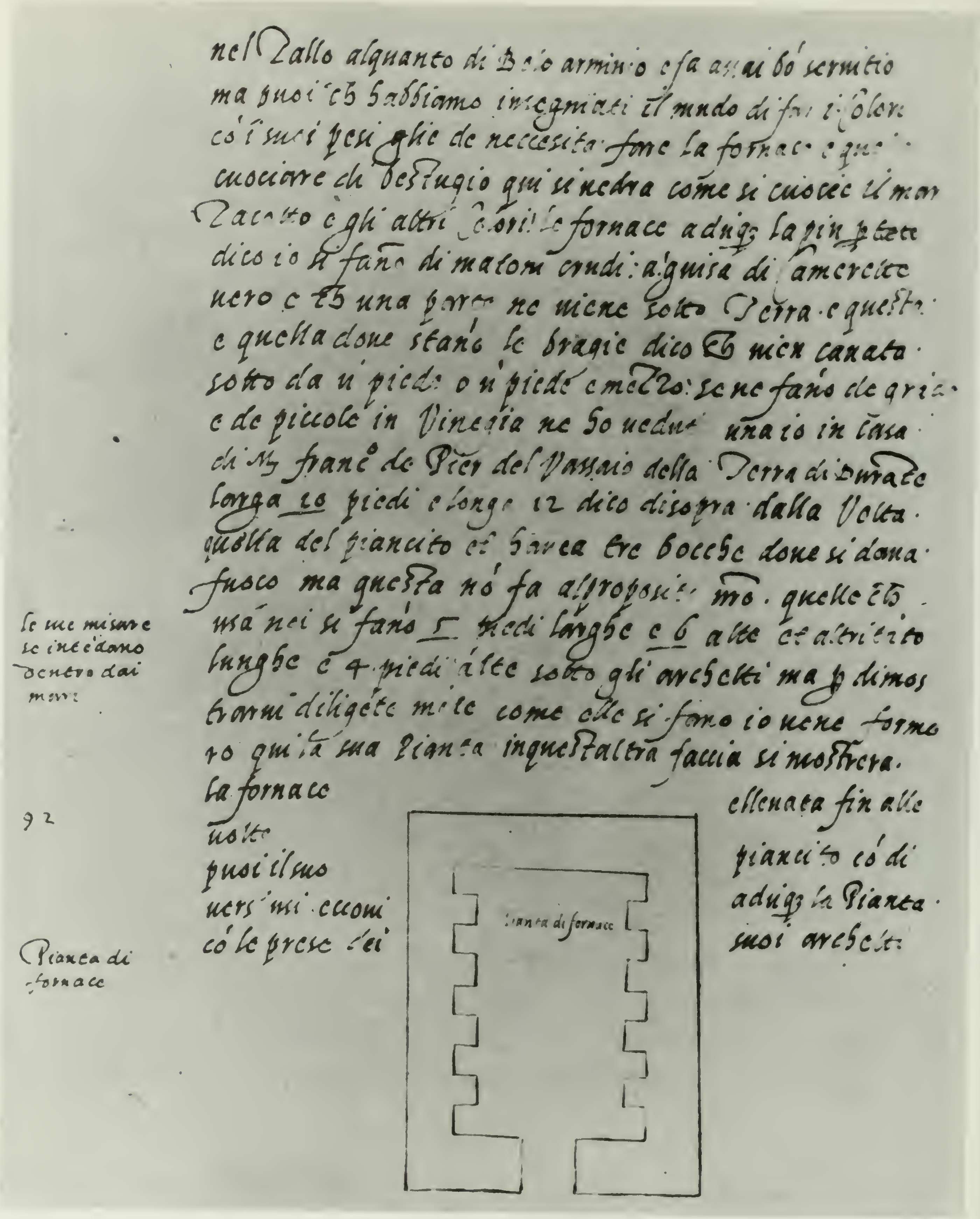


Figure 98. Piccolpasso Kiln (1548). Note lower heat chamber, upper pot chamber with vent holes in floor, peep holes, and curved roof.



nel zallo alquanto di Bolo armin.o e fa assai bo' servitio
ma puoi che habbiamo insegniati il mudo di far i colori
co' i suoi pesi glie de necessita porre la fornace e quel
cuocierre ch bisugnio qui si vedra come si cuoce il mar
zacotto e gli altri colori le fornace adunq. la piu parte
dico io si fano di maloni crudi: a guisa di camerette
vero e che una parte ne viene sotto terra e questa
e quella dove stano le bragie dico che vien cavato
sotto da u' piede o u' piede e mezzo: se ne fano de gran
e de piccole in Vinegia ne ho veduta una io in casa
di M. Franc.o de Pier del Vasaio della Terra di Durante
larga 10 piedi e longa 12 dico di sopra dalla volta
quella del piancito e' havea tre bocche dove si dona
fuoco ma questa no' fa al proposito mio. quelle che
usa noi si fano 5 piedi larghe e 6 alte e altritanto
lunghe e 4 piedi alte sotto gli archetti ma p dimos
trarmi diligente molto come elle si formo io ne ne formo
ro qui la sua pianta in questaltra faccia si mostrera.

le me misure
se intendono
dentro dai
muri

92

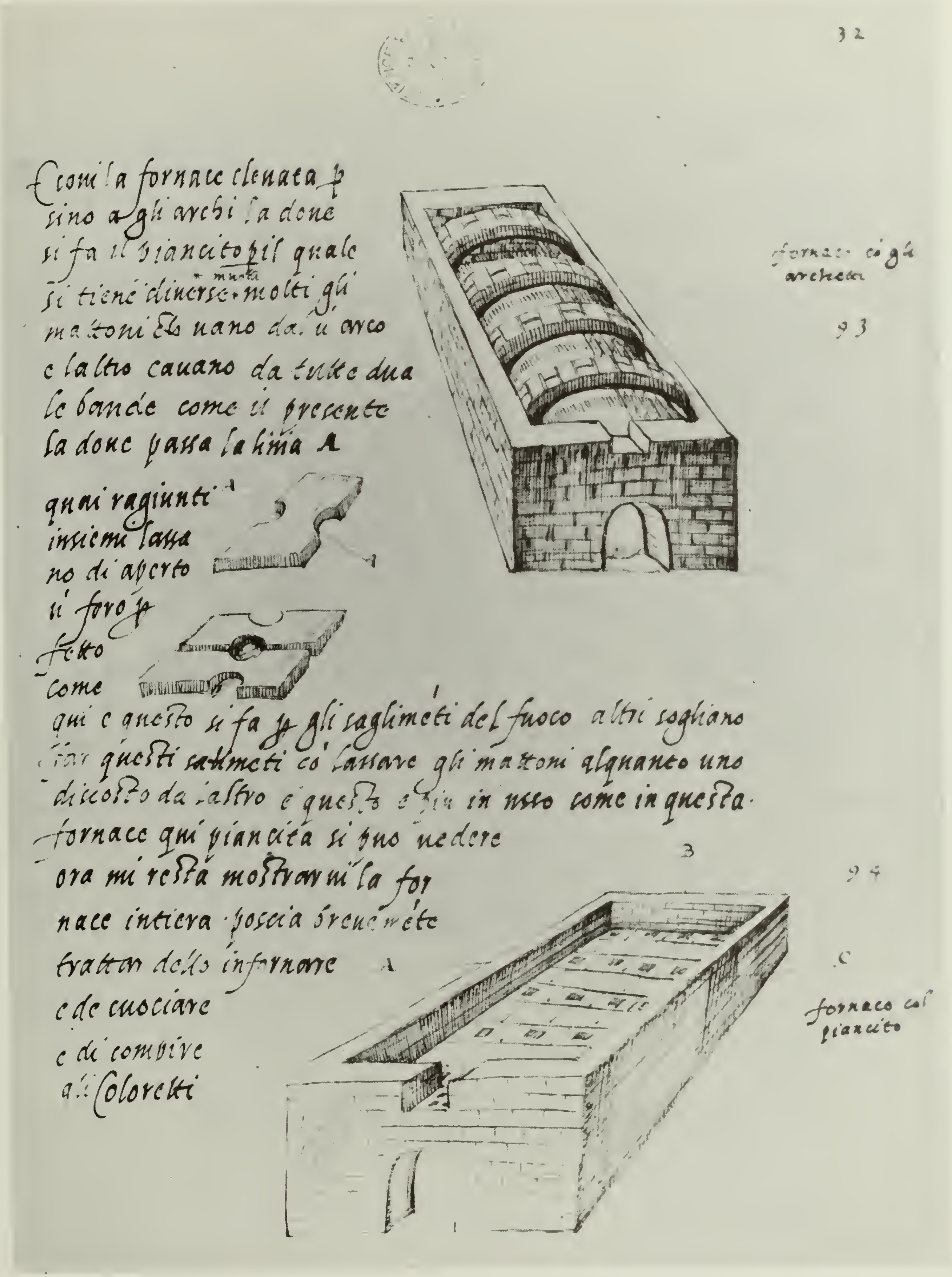
la fornace
volte
puoi il suo
vers' mi cuoni
co' le prese dei

ellevata fin alle
piancito co' di
adunq la pianta
suoi archetti.

Pianta di fornace

Pianta di
fornace

Figure 99. Piccolpasso Kiln (1548). Plan of lower heat chamber with arches and vents.



Eccomi la fornace eleuata p
sino a gli archi la doue
si fa il piancito p il quale
si tiene diuerse + muta molti gli
mattoni stanno da un arco
e laltro cauano da tutte dua
le bande come il presente
la doue passa la fiama A
quai ragiunti
insieme lassa
no di aperto
il foro p
fetto
come
qui e questo si fa p gli saglimeti del fuoco altri sogliano
far questi salimeti co lassare gli mattoni alquanto uno
discosto da laltro e questo e piu in usso come in questa
fornace qui piancita si puo uedere
ora mi resta mostrarui la for
nace intiera poscia breuemete
trattar dello infornare
e de cuociare
e di compire
gli Colorelli

Figure 100. Piccolpasso Kiln (1548), lower heat chamber with arches (upper drawing) over flue and vented floor of pot chamber (lower).

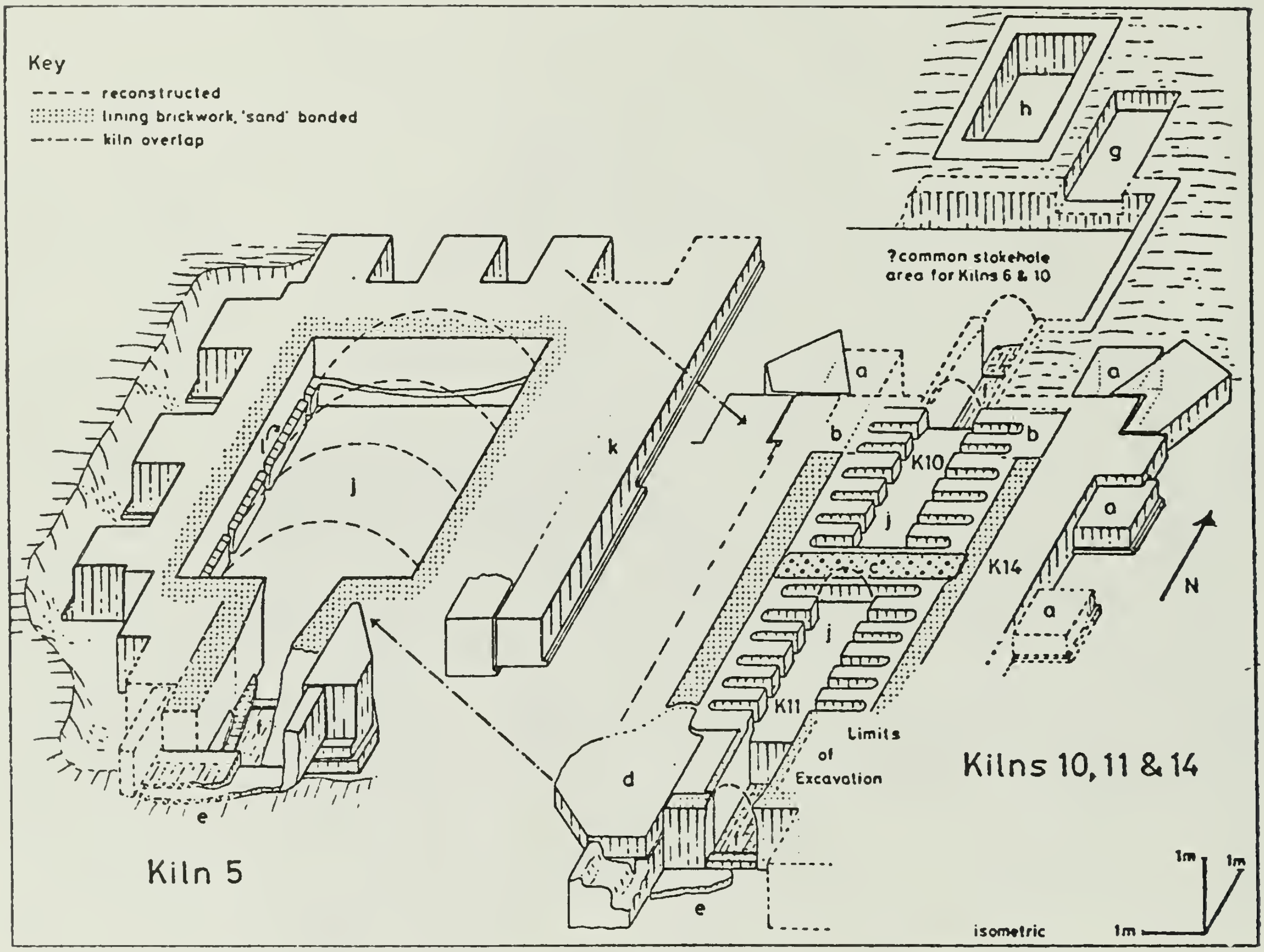


Figure 101. Rectangular Kilns, Vauxhall.
(Edwards 1981-82)

FOOTNOTES

1. Brian J. Bloice, "Norfolk House, Lambeth: Excavations at a Delftware Kiln Site, 1968", *Post-Medieval Archaeology*, Vol. 5 (1971), pp.99-159, London. 1972.

2. Graham J. Dawson, "Two Delftware Kilns at Montague Close", *London Archaeologist*, Vol. I, no. 10, pp. 228-231, London, 1971. See also *Post-Medieval Archaeology*, Vol. 4 (1970), pp.183-184. *Ibid*, Vol. 5 (1971), pp.212-214. Also "Montague Close Excavations 1969-73, Part I", *Surrey Archaeological Society Research* Volume 3, pp.52-54.

3. Roy Edwards, "Vauxhall Pottery Excavations - Fourth Interim Report, mimeographed, London, 1979. Also "The Vauxhall Pottery: History and Excavations 1977-81", *London Archaeologist*, vol. 4, nos. 5 and 6 (1981-2).

4. V.R. Christophers, D.C. Haselgrove, O.H.J. Pearcey, "The Fulham Pottery, A Preliminary Account", *Occasional Paper* I, Fulham and Hammersmith Historical Society, Archaeological Section, (Rev.), 1977.

5. Cipriano Piccolpasso, *The Three Books of the Potter's Art*, ed. by Bernard Rackham and Albert Van de Put, The Victoria and Albert Museum, London, 1934.

6. Edwards, 1981-82 (*op.cit.*) and personal visits to Fulham and Vauxhall sites.

7. S. Pryor and K. Blockley, "A Seventeenth-Century Kiln Site at Woolwich", *Post-Medieval Archaeology*, vol. 12, (1978), pp.30-85, London, 1978.

8. Edwards, 1981-82 (*op.cit*).

CHAPTER 9

OTHER STRUCTURES, FEATURES, AND WASTER PITS

Structure 1 (Workshop Room)

As mentioned in the previous chapter, a work area or room is present adjacent to the north side of the Large Kiln. The stoke hole pit and firebox project into this area, believed to have been a Workshop Room. As with the Large Kiln, the room was also built below ground level, so that the subsoil floor of the room is 3.8 ft. to 4.43 ft. below present ground surface.

Marl foundation walls form the eastern and western boundaries of the room. (Figures 20,21,102-110). These walls presently consist of only occasional roughly-squared blocks of marl, set without mortar, but probably packed with a light brownish-grey clay usually associated with marl wall construction on the site. Each wall presently measures 2 ft. in width and 0.8 ft. in vertical thickness. Each wall had been built flush against the earthen walls of the excavated hole (Figures 106,107). The marl walls each measure 19 ft. in length and, on the north side, terminate where the subsoil or floor level ascends to meet the higher floor level of Structure 2. The marl walls may have served as foundations for brick walls, since occasional mortared bricks were found *in situ* on the marl.

The room measures a maximum of 23 ft. (north-south) by 17.5 ft. (east-west). The southern boundary of the room is determined by two yellow brick walls, each of which angles inward (c.45°) toward the Large Kiln. Unfortunately, the exact point of articulation with the kiln remains a mystery due to past disturbances in this important area.

Both angling brick walls abutt the marl walls and a good amount of mortar is present at the point of contact. Each brick wall is c.7 ft. in length and 1-1/2 bricks wide (1.1 ft.). The

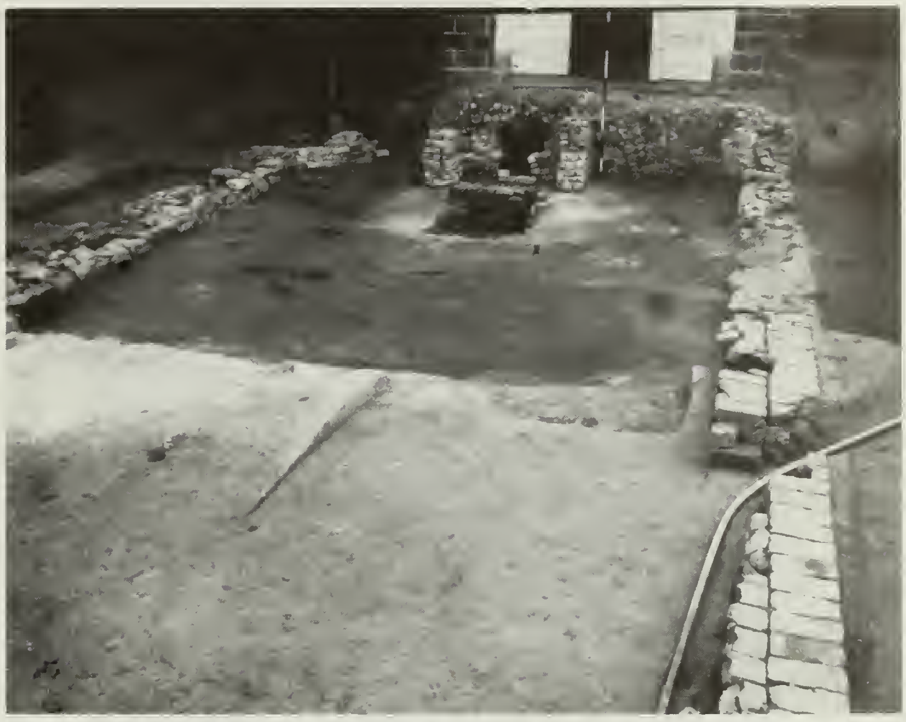


Figure 102. Structure 2 (foreground), Structure 1, and firebox area of Large Kiln. Looking south.

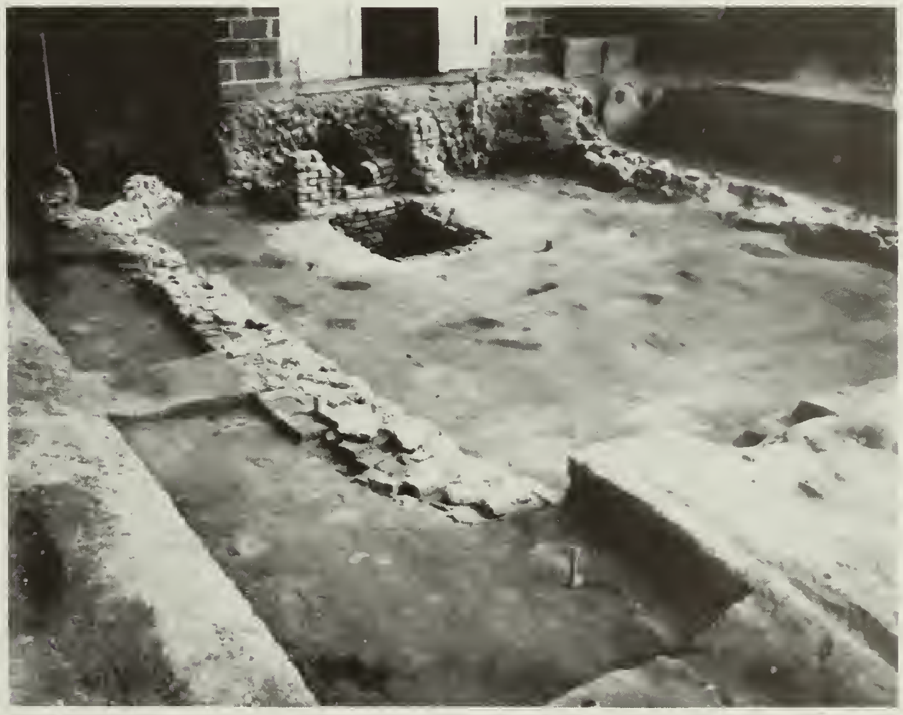


Figure 103. Structure 1 and firebox area of Large Kiln. Looking southwest.

west angling wall survives to a height of 3 ft. (12 courses) and the east wall reaches a maximum height of 1.2 ft. (5 courses). Each wall is laid in Flemish bond with red and yellow bricks and mortar. Both walls rest on subsoil at floor level. The south ends of both walls are jagged due to post-kiln disturbances.

Structure 1 probably served as an area where a variety of jobs were performed - when firing the kiln, wood could be stacked here; pots could be stored in the room, so as to be ready for loading into the kiln. There is also evidence that final glazing or dipping operations were at least carried out in this room, as 18 round to oval maroon-colored soil stains, probably iron oxide, were found on the room floor surface, mostly on the east side of the room. The majority are roughly circular in shape, varying from one-half foot to 3.2 ft. in diameter, but averaging c.1 ft. The soil stains forms no discernable pattern, but the majority are located in the eastern one-half of Structure 1.

The archaeological fill within the confines of the Workshop Room had a volume of c.1,584 cubic feet. The greatest amount of pottery and brick rubble found at the site came from this room. (Figure 108). Four or five different layers of soil and debris could be distinguished by variations in color and texture and content. Nearly all layers contained brickbats, but a main rubble layer often measured 1-2 ft. in thickness, contained thousands of yellow or red, glazed or unglazed, arch or ordinary brick, together with large quantities of pottery. Concentrations of clay pads or other kiln furniture as well as rocks, probably used for glaze ingredients, were found in this fill. All fill represents post-kiln debris - materials deposited in the area once the pottery factory had gone out of business.

It is not clear how Structure 1 was roofed, if indeed it was. It is probable that a roof was present. If not, Structure 1 could easily have been flooded by a thunderstorm, which occur frequently in Yorktown at certain times of the year. No archaeological evidence was found for central support posts, however.

The marl and/or brick foundation walls probably reached at least to ground surface, to prevent the earth behind the walls

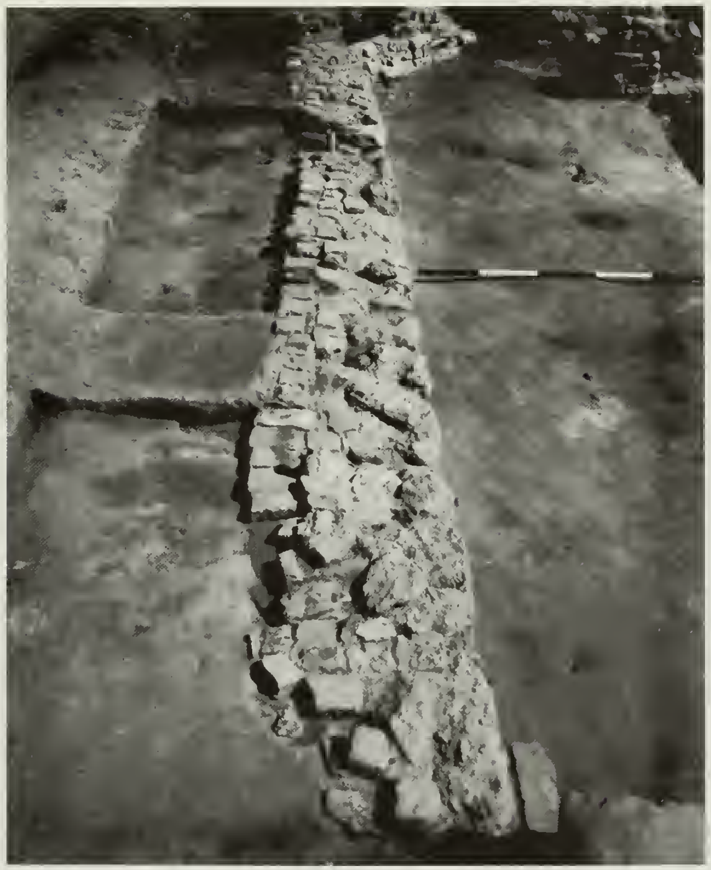


Figure 104. Structure 1 east foundation wall. Looking south.

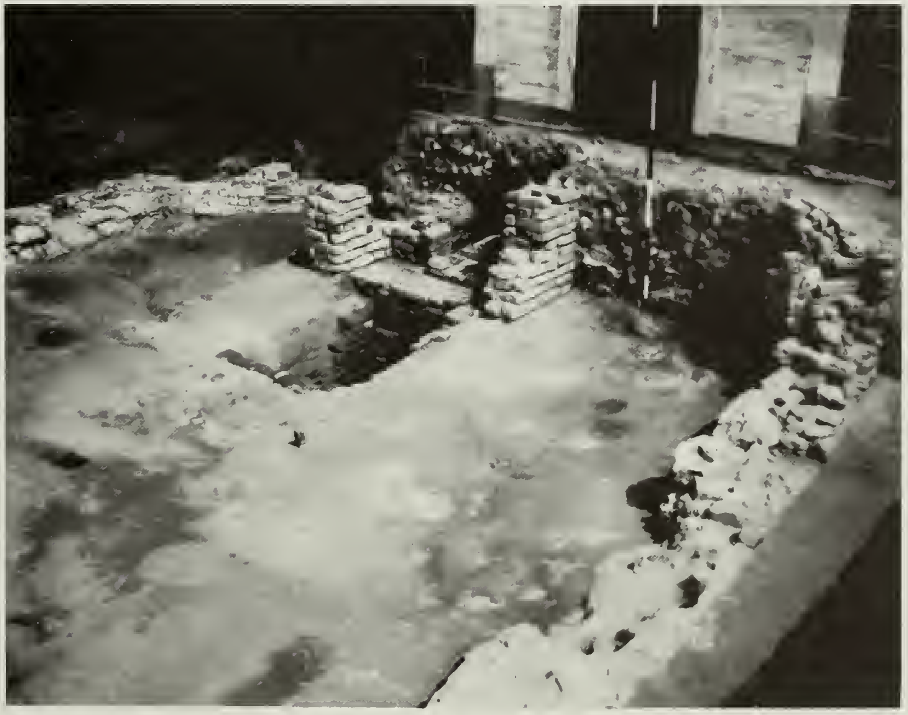


Figure 105. Structure 1 and firebox area of Large Kiln. Looking southeast.

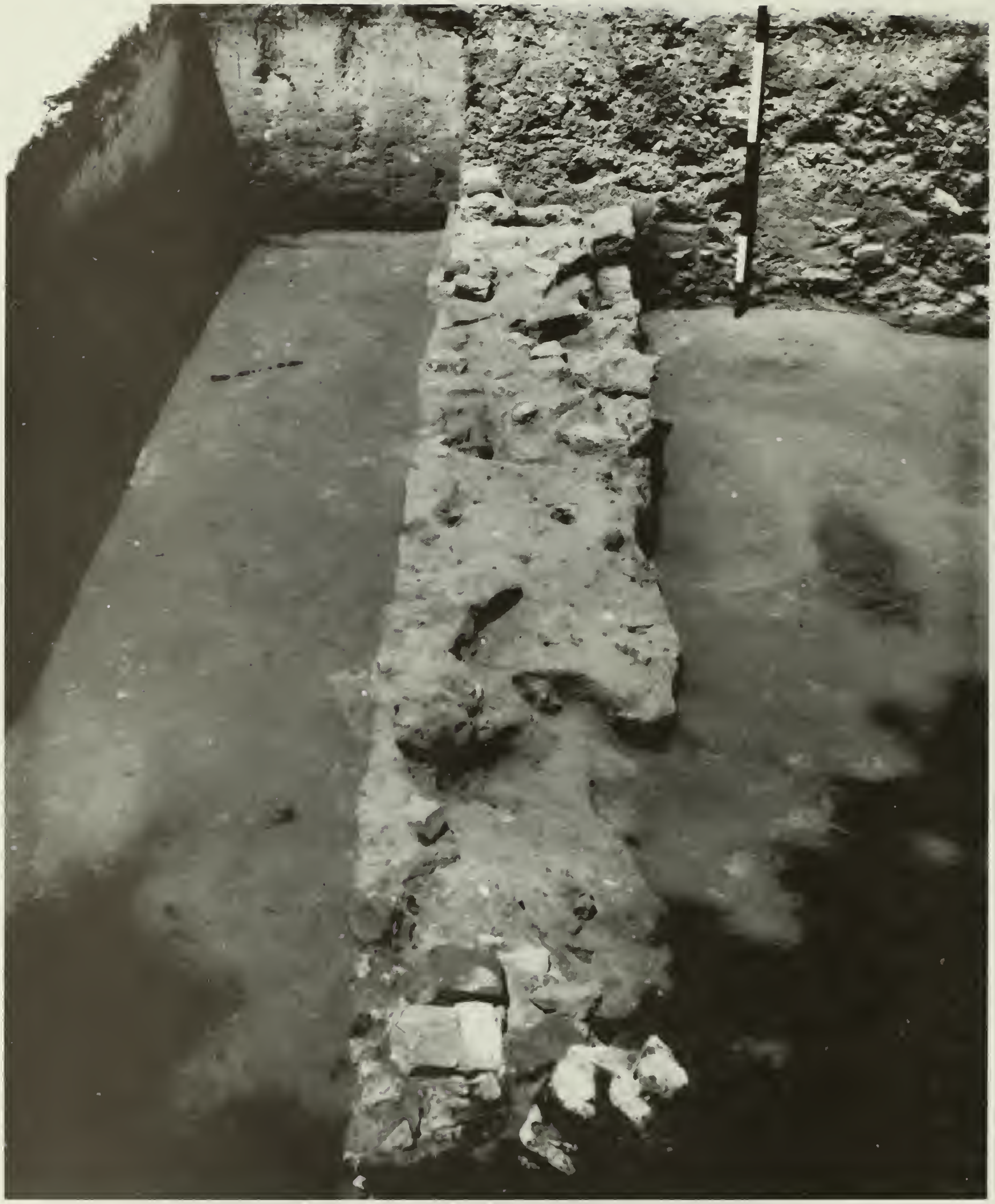


Figure 106. West foundation wall, Structure 1. Looking north.

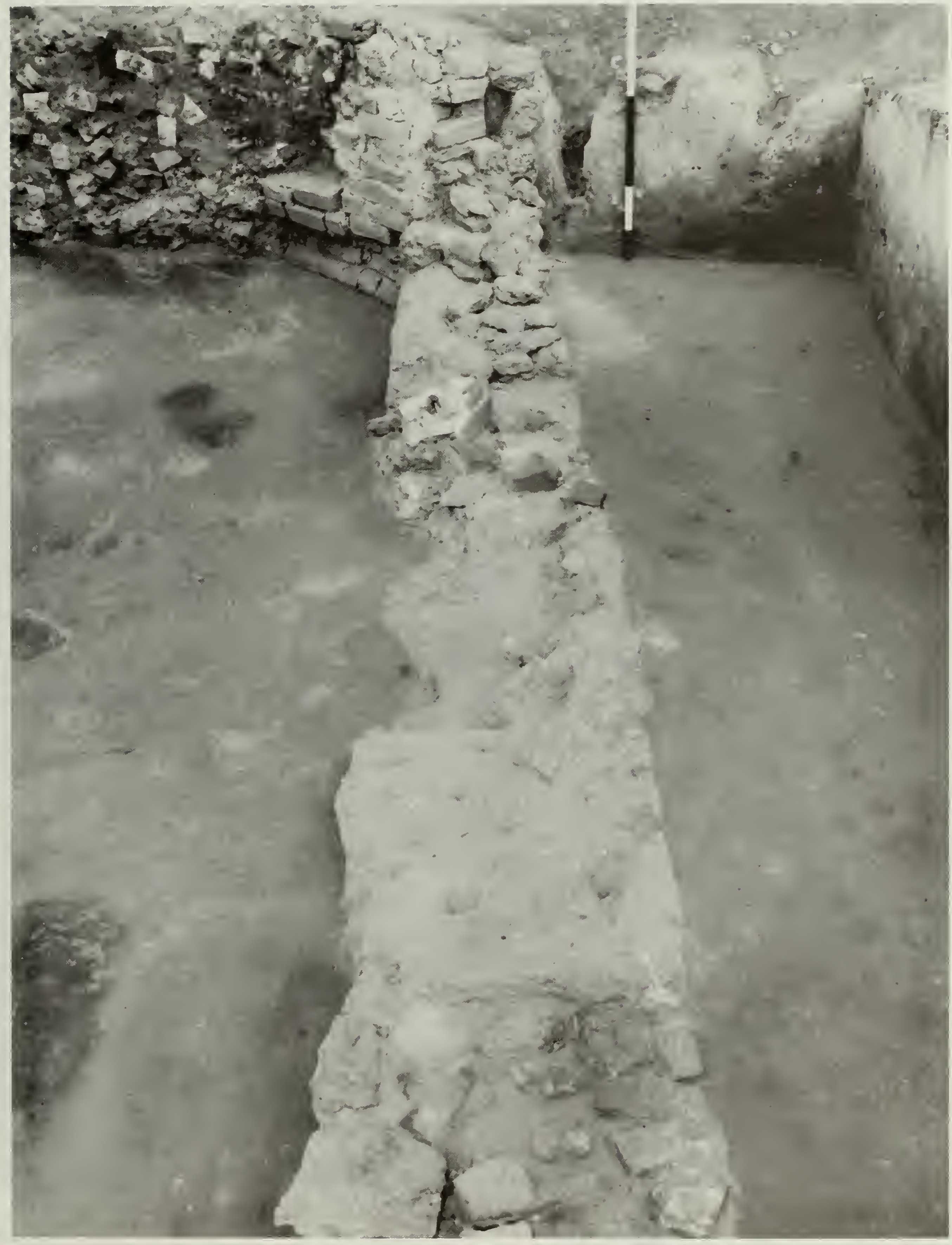
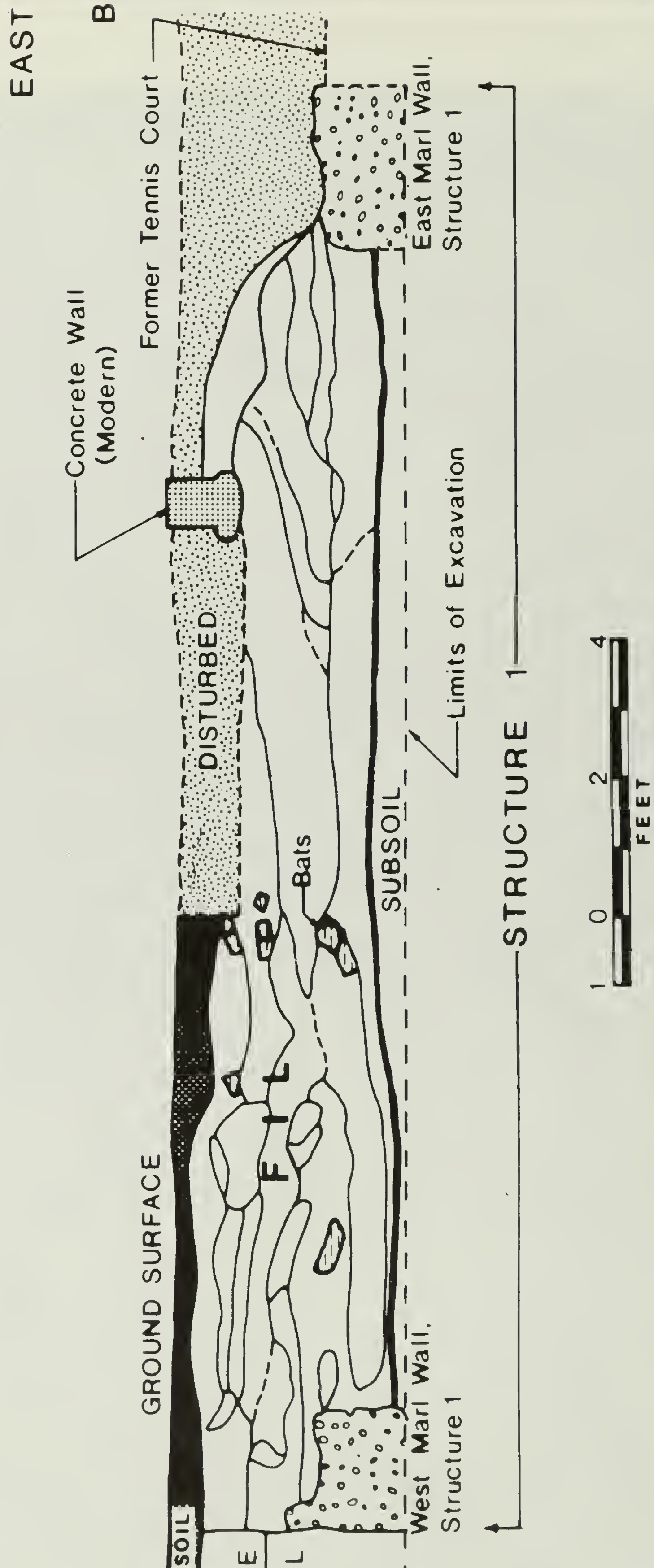


Figure 107. West foundation wall of Structure 1 and angling wall. Looking south.



STRATIGRAPHIC SECTION, STRUCTURE NO. 1

FIGURE 8

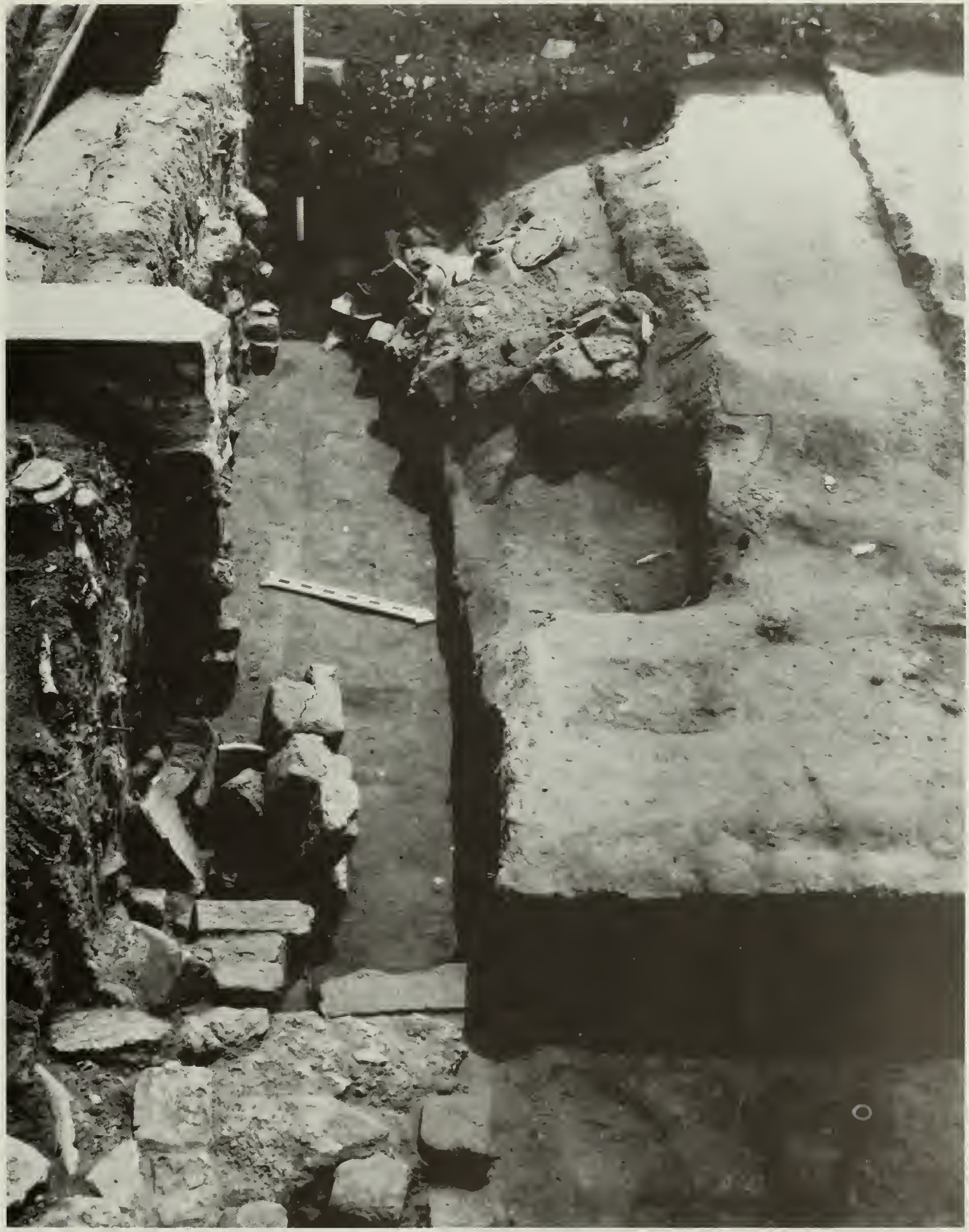


Figure 109. Juncture of Structure 1 (left) with Structure 2 (right). East wall of Structure 1 at lower left. Looking west.

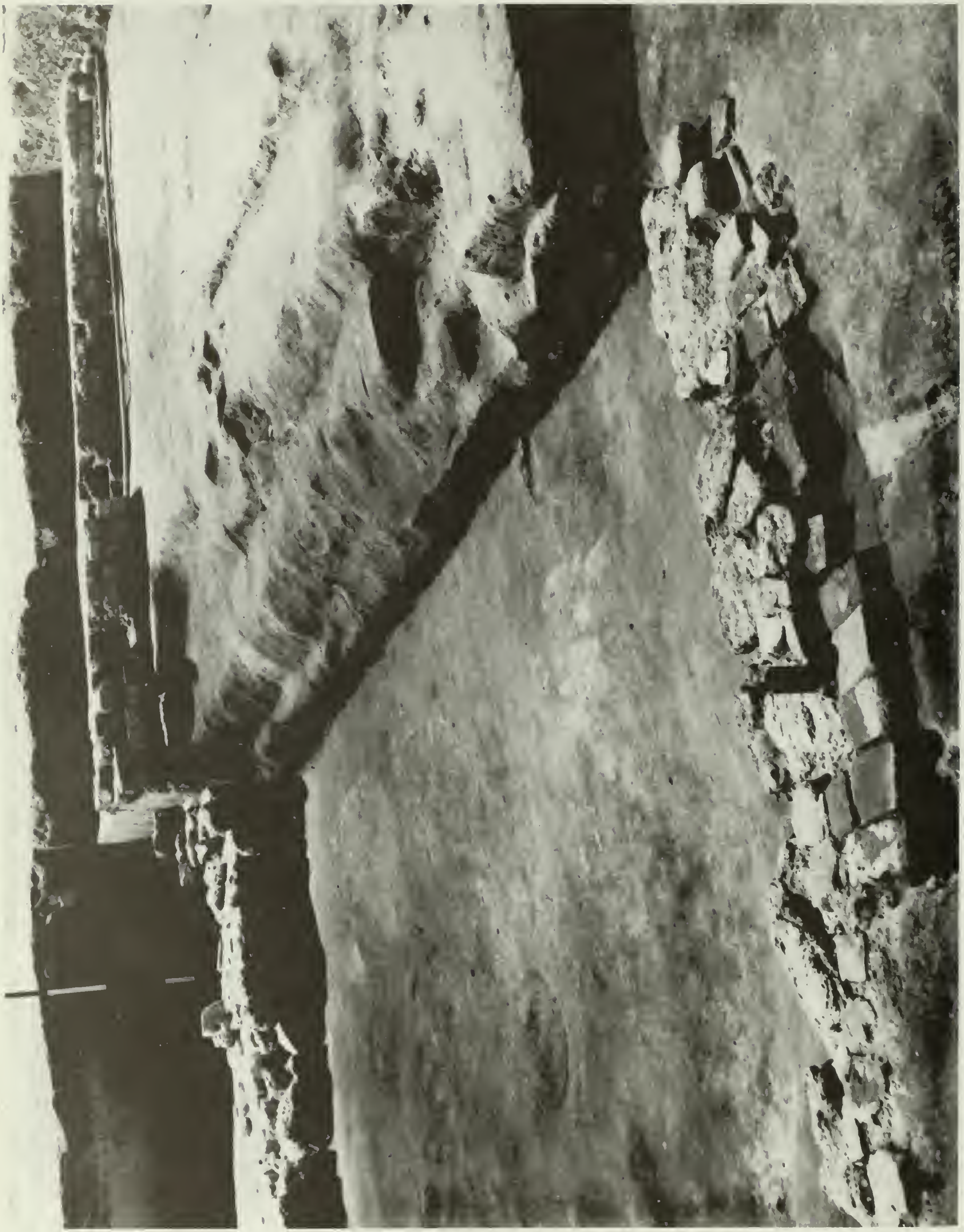


Figure 110. Structure 1 (Workshop Room) to left, Structure 2, at higher level, to right. Note 'steps' carved from subsoil. Looking west.

from caving in. At this point, the foundation walls may have supported vertical beams for a roof support, and a partially open wall. The open walls would have been more conducive to increase air circulation for the kiln.

Structure 2 (Workshop Building)

Structure 2 was a 54 ft. by c.17 ft. (interior dimensions) building which connected with the north end of Structure 1. (Figures 109,110). Only the west wall of Structure 2 is extant today, although portions of it have been damaged. The eastern one-half of the building has been extensively disturbed by recent construction for a driveway, a concrete retaining wall, a drainage ditch, and a tennis court. These construction activities destroyed the east wall of Structure 2. However, given the symmetry of the factory complex, it is almost certain that the east wall of Structure 2 connected with the east wall of Structure 1 and was of identical construction and dimensions to the Structure 2 west wall.

The west brick wall of Structure 2 measures 54 ft. in length and survives to a maximum height of four courses. (Figures 111-114). The lower three courses of brickwork form a foundation two bricks wide (1.5 ft.), laid in English bond. This foundation in turn supported a narrower 1-1/2 brick wall, which survives as a fourth course in limited areas. The narrower brick wall was also laid in English bond and is centered over the two brick wide foundation. The walls of Structure 2 were thus of the same width as the Structure 1 angling walls, although the method of brick construction or bonding differs.

The Structure 2 west wall is aligned slightly more toward the west than the Structure 1 walls. The south end of the Structure 2 wall does not squarely meet the corresponding Structure 1 wall, and is horizontally separated from the latter by several inches. Closers are present near both ends of the Structure 2 wall. The gap between walls may be insignificant, since the walls as found are on different levels: the base of the Structure 2 wall is

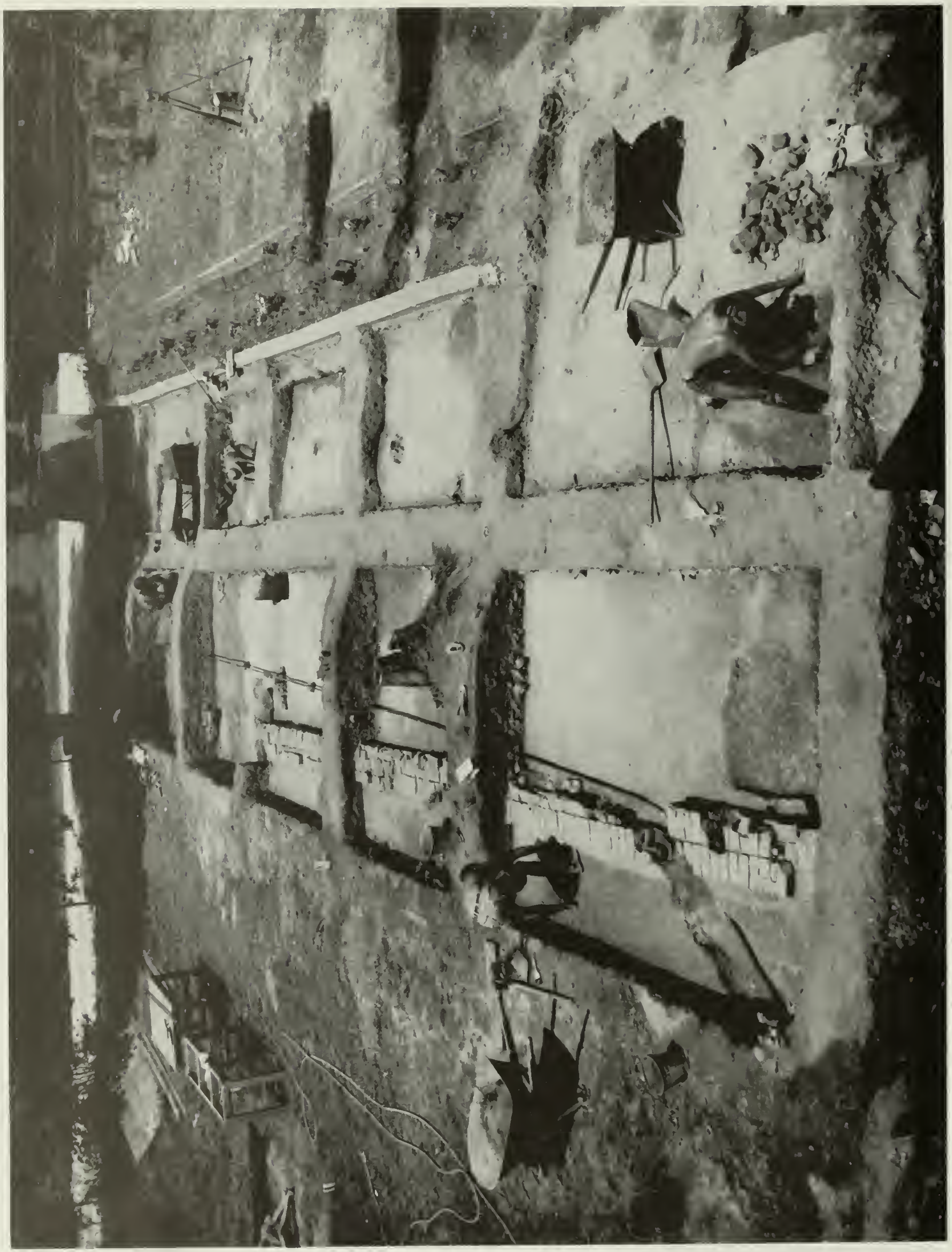


Figure 111. Excavations of Structures 2 and 3, with brick foundation wall of Structure 2 at left. Looking north.

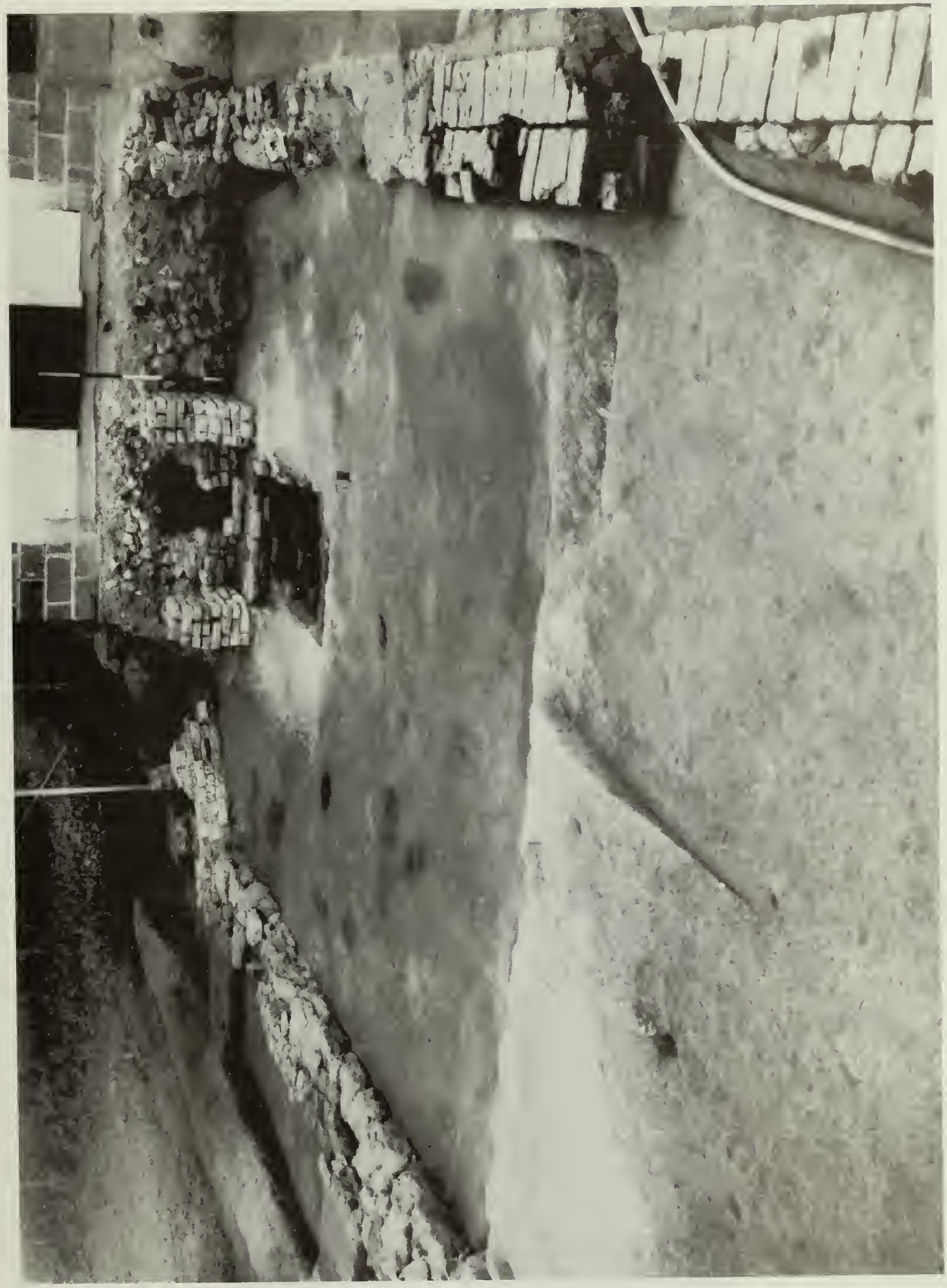


Figure 112. Structure 2 (foreground) in relation to Structure 1 and Large Kiln. Looking south.

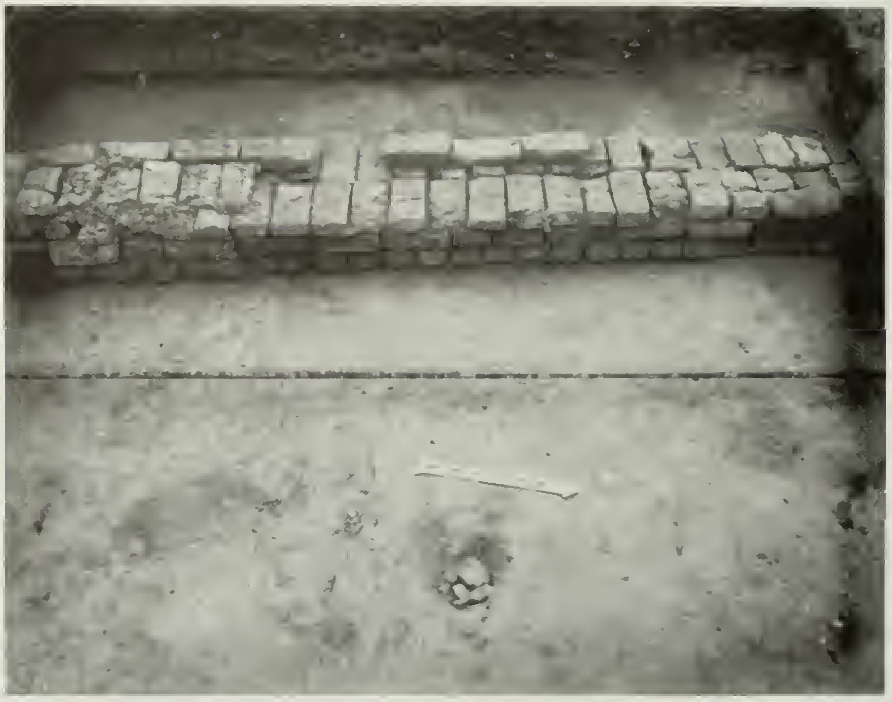


Figure 113. West wall of Structure 2. Looking west.

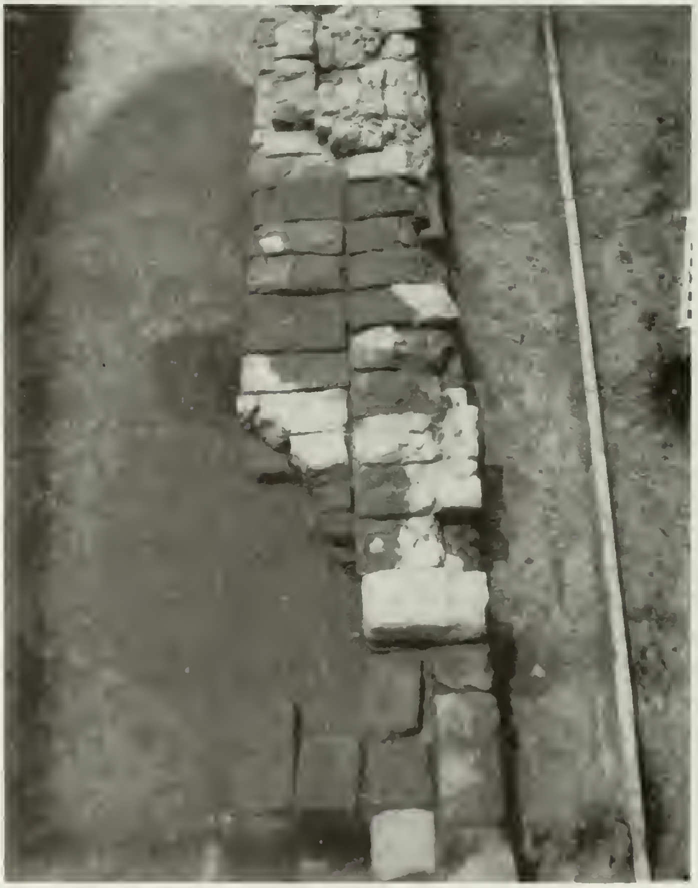


Figure 114. West wall of Structure 2.
Looking north.

presently 0.8 ft. above the top surface of the Structure 1 marl wall. At a higher elevation, Structures 1 and 2 may have abutted one another to form continuous walls.

A three inch wide remnant of the builders trench is discernable paralleling the west edge of the Structure 2 wall. The wall was laid upon subsoil at a depth of 1.6 ft. below ground level. The floor of Structure 2, formed by the suboil, was situated at the same level or slightly higher. There is no archaeological evidence for a wooden floor. The floor level of Structure 2 is presently c.2.5 ft. above the floor of Structure 1.

No evidence was found for a east-west oriented wall separating or dividing Structure 1 from 2, with the possible exception of a large (12" x 5 x 4) brick, found in situ at floor level along the northwest interior edge of 1the Structure 1 east wall. The higher floor level of Structure 2 gradually merges with the lower Structure 1 floor through a stepped slope of the subsoil. The archaeological evidence strongly indicated two or three narrow, level steps had been cut out of the natural sand subsoil. The slopes and steps are actually within Structure 2, and end abruptly with a straight vertical face, 0.4 ft. in height, which is oriented at right angles to the brick walls but is exactly in line with the juncture of the Structure 1 and 2 walls.

It is possible, yet awkward, to move between Structures 1 and 2 by the use of these steps. It seems more likely that wooden steps or a ramp-like structure was originally situated over these steps and slope, although no traces of either could be discerned. One square posthole was found in the slope in the center of Structure 2, and measured seven inches square. Another probable posthole, 15 inches square, was in line with it but 8 ft. to the north. These postholes may represent two locations of former central roof support beams.

No evidence for a fireplace was found in Structure 2, giving further credance to the belief that Structures 1-3 were actually interconnected units of one long building, with winter warmth provided by the heat generated through the firing of the kiln.

If this thinking is valid, it in turn indicates that Structure 1 may have had solid walls, and not open vertical beam construction supported on marl-brick foundations.

The northern one-third of the Structure 2 west wall has been disturbed. However, the north edge of this wall is definitely the end of the wall, as is indicated by brick closers.

In summary, Structure 2 was a long building of the same width as Structure 1. The east one-half of the building and portions of the west one-half had been disturbed in the last 30-40 years, with all of the east brick wall and 10.5 ft. of the west brick wall having been disturbed. Because of these disturbances, relatively few interior features were discerned, with the exception of a few postmolds and the sloped-step area connecting Structures 1 and 2.

Structure 2 was probably a one or one and one-half story wooden building, judging by the one and one-half brick wall which the two brick wide foundation supported. Structure 2, articulating as it does with Structure 1 and the Large Kiln beyond, must have been the main workshop-storage area of the factory.

There is some evidence that suggests some activity had taken place in the Structure 2 area prior to the construction of Structure 2. Darker soils containing pottery fragments are present under portions of the west brick wall of Structure 2. These deposits could represent filling of low areas immediately prior to construction of the Structure 2 wall.

Structure 3

The evidence for Structure 3 is incomplete and therefore inconclusive due to the numerous disturbances which have destroyed potions of the building (Figure 20). These disturbances include a later 18th C. trash pit, a large 19th C. trench measuring 8 ft. in width and a minimum of 18-20 ft. in length, and a modern water pipe trench. Road grading for adjacent Read Street has removed building remains and strata in the northern portion of Structure 3.

However, enough evidence remains to suggest that Structure 3 was a basemented brick building built on marl foundation walls, and thus resembles Structure 1 both in method of construction and in similarity of floor level (in relation to Structure 2 and ground level). (Figures 115,116).

The east wall of Structure 3, as with Structure 2, had been completely destroyed by modern construction. There is only slight evidence remaining of the west wall of Structure 3, in the form of a few marl blocks against the north end of the Structure 2 brick wall and a soil stain containing marl fragments, which continues in line from the same Structure 2 wall.

The subsoil floor level of Structure 2 terminates at a point parallel with the north edge of the west brick wall. At this point, in Structure 3, an irregular "wall" of marl blocks, c.2 ft. in width, runs in a line slightly north of grid east-west. The basal level of these blocks as well as the floor level of Structure 3 is 1.4 feet lower in elevation than the floor of Structure 2, but c.0.8 ft. higher than the floor of Structure 1. However, the floor levels of both Structures 1 and 3 were lower in elevation than Structure 2 and both Structures 1 and 3 had marl foundations. Another similarity between Structures 1 and 3 is the presence of maroon soil stains in undisturbed portions of Structure 3. Undoubtedly, more stains once existed.

Several additional features were found within the relatively undisturbed southern one-third of Structure 3 - Features 1 and 2 and an occupation level. The latter is in the form of a thin layer of light grey clay immediately on top of the yellow subsoil. This clay is very pure and refined, free of impurities, and may have been the clay from which pottery was made. The clay covers a minimum area of 17 ft. (east-west) by 8 ft. Within the clay area are Features 1 and 2.

Feature 1 was marked by a layer of white ash, immediately beneath which were four ash-filled holes connected to one another by narrow and shallow ash-filled trenches. The feature is square in shape, measuring three feet by three feet, and the four corner

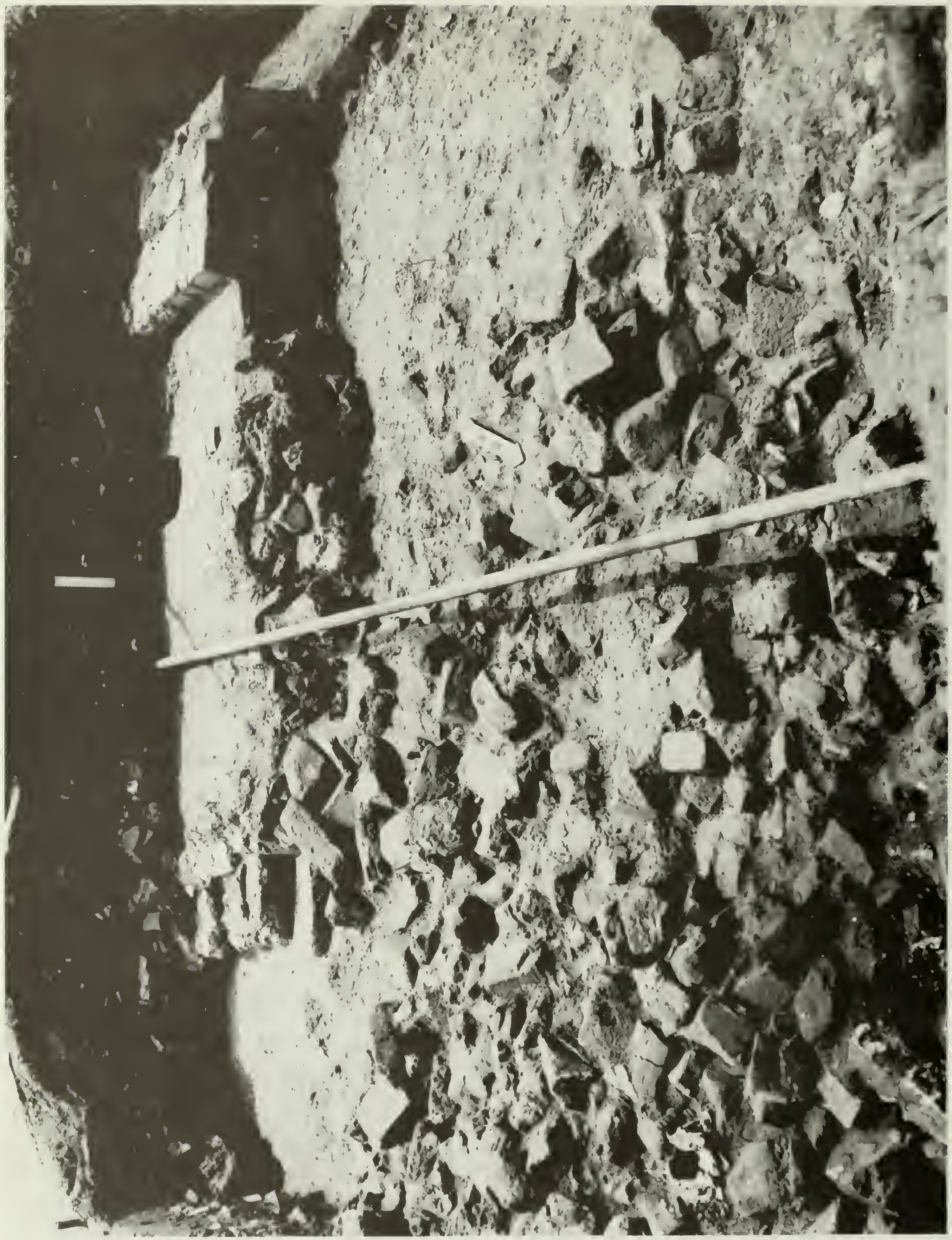


Figure 115. Juncture of Structures 2 and 3, with north end of west brick wall of Structure 2 at upper right. Looking south. Note marl debris at juncture.

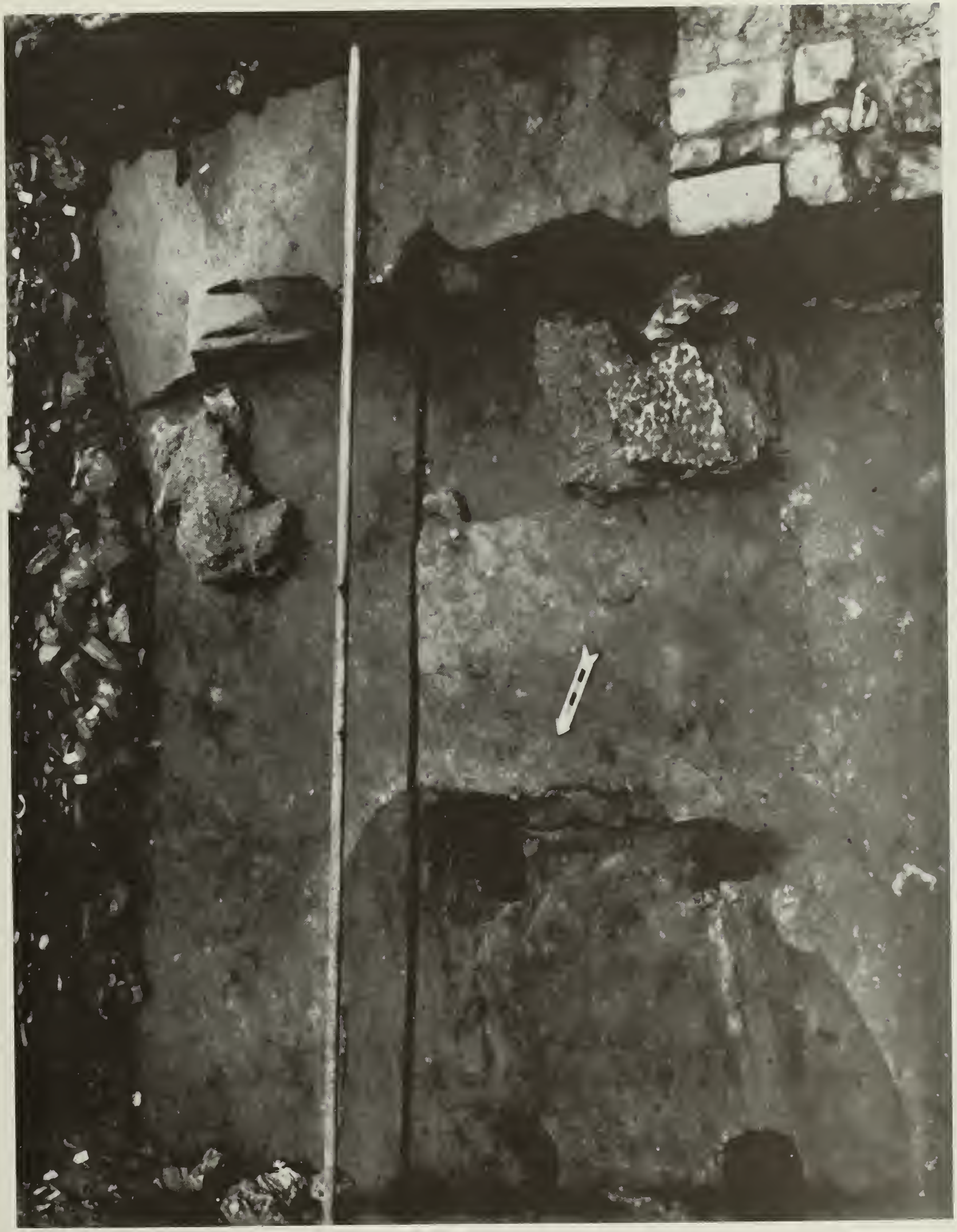


Figure 116. Juncture of Structure 2 (right) with Structure 3 (left). North end of Structure 2 brick wall at lower right. Feature 1 at right. Looking east.

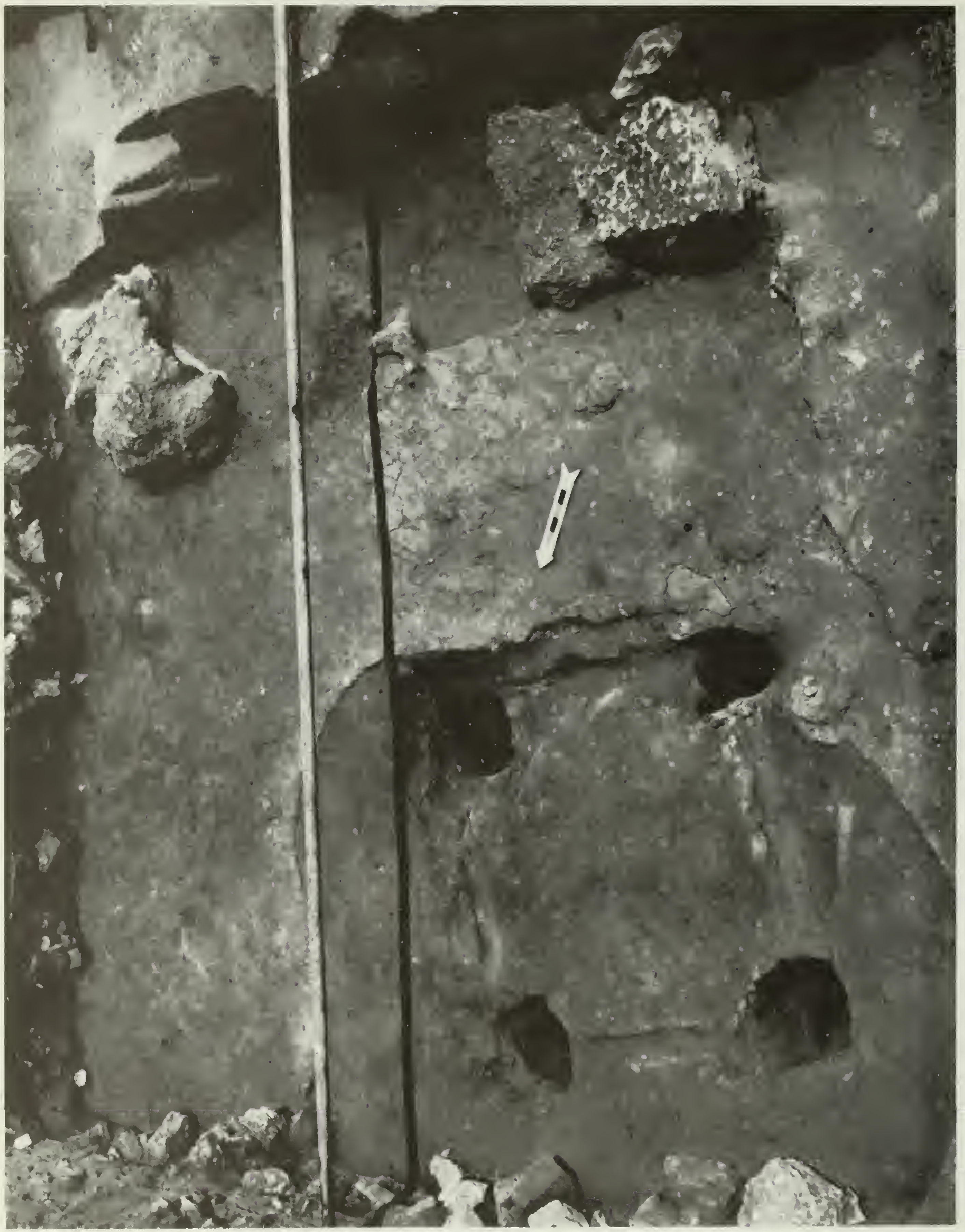
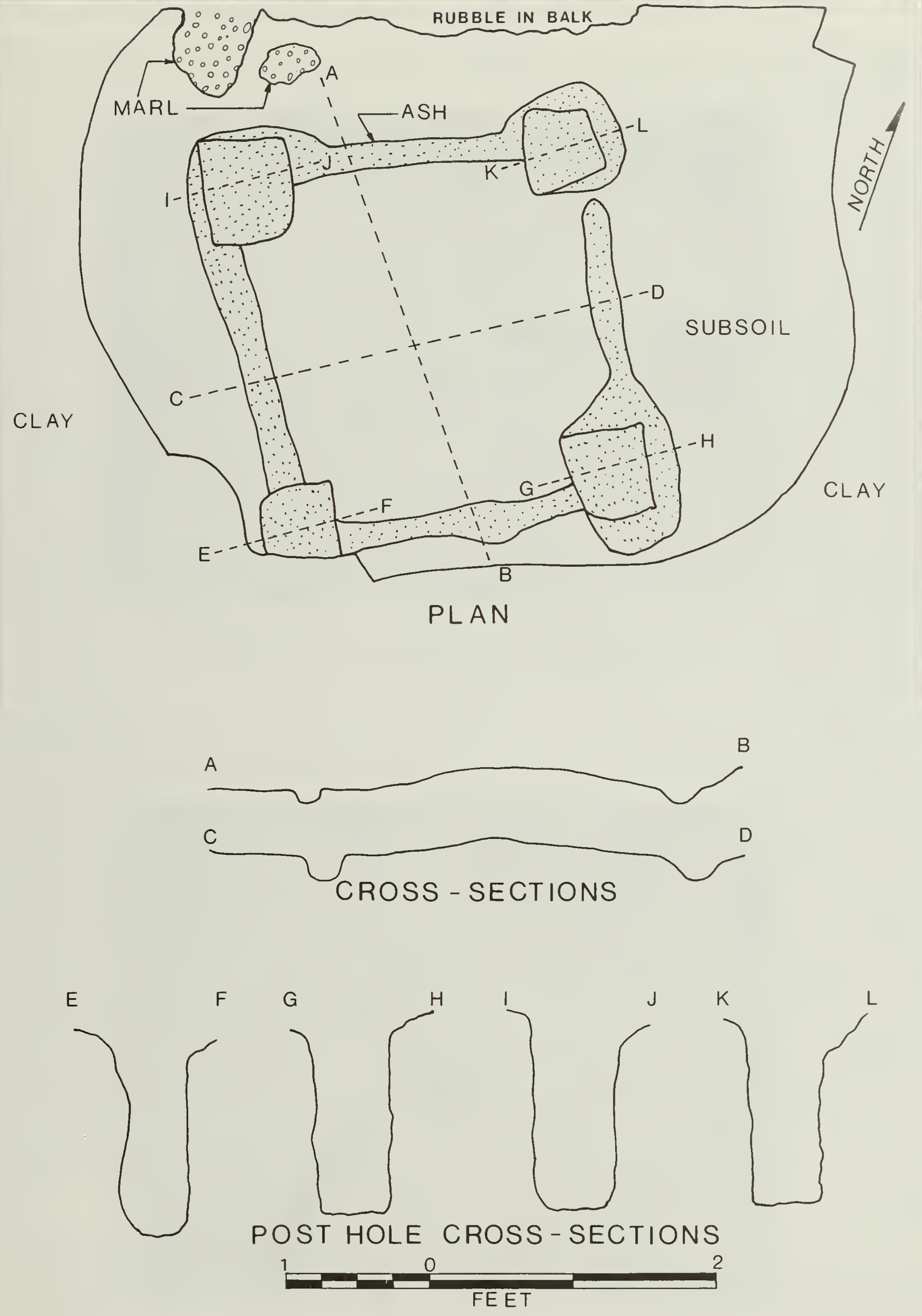


Figure 117. Feature 1 (left) within Structure 3. Looking east.



FEATURE 1 IN STRUCTURE NO. 3

FIGURE 118

holes are 0.5-0.6 ft. square and 1.3-1.4 ft. in depth. The connecting trenches are 0.2-0.3 ft. wide and 0.2 ft. in depth. (Figures 116-118).

The four holes, one in each corner, are post molds, and mark the former location of verical squared wooden posts. The connecting trenches probably mark the former position of horizontal braces or boards that had interlocked with or had been nailed to the posts. Feature 1 may represent the remains of either a wooden clay working or throwing table or bench (Figure 306) or a potters wheel. The associated grey clay level, immediately upon the floor of Structure 3, may represent the clay that had been worked on the table or wheel. Both the ash deposit and the grey clay contained specks of charcoal. The charcoal and ash suggest Structure 3 may either have burned or that ash may have been used inside the building as part of the potting operation.

Feature 2

The grey clay extends eastward to the area where the Structure 3 east wall supposedly would have been. The grey clay abutts Feature 2, a brick feature which is located 11 ft. east of Feature 1. (Figures 20,119,120). Feature 2 is a row of six bricks, two courses in depth, mortared together, measuring 2.3 ft. (east-west) by 0.7 ft. Due to its short length, Feature 2 was not a wall but it may have been something like a bench support.

Features 1 and 2 further indicate that Structure 3 was an integral part of the factory complex. As mentioned previously, Structure 3 could have served as a work area for the supposed third kiln. However, the location of another kiln is a problem, and there is no evidence for it. The presence of maroon soil stains in Structures 1 and 3 may indicate that similar activities took place in both structures.

The area to the north of Features 1 and 2, within Structure 3, had been severely disturbed by Features 3-6. The excavated portions of these features are contained within a 24 ft. square area, and Features 4 and 5 were not completely excavated.

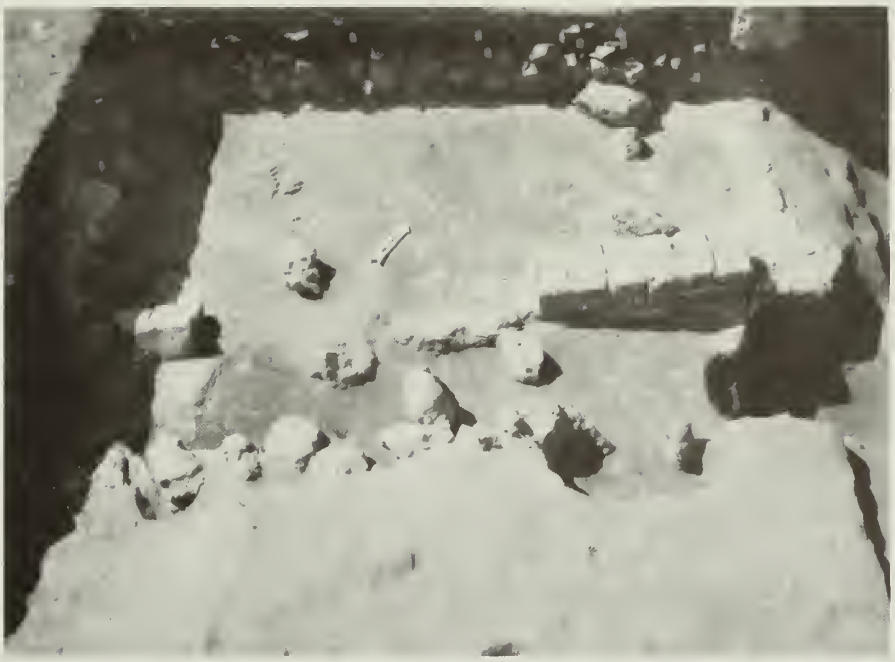


Figure 119. Feature 2 brickwork.
Looking north.

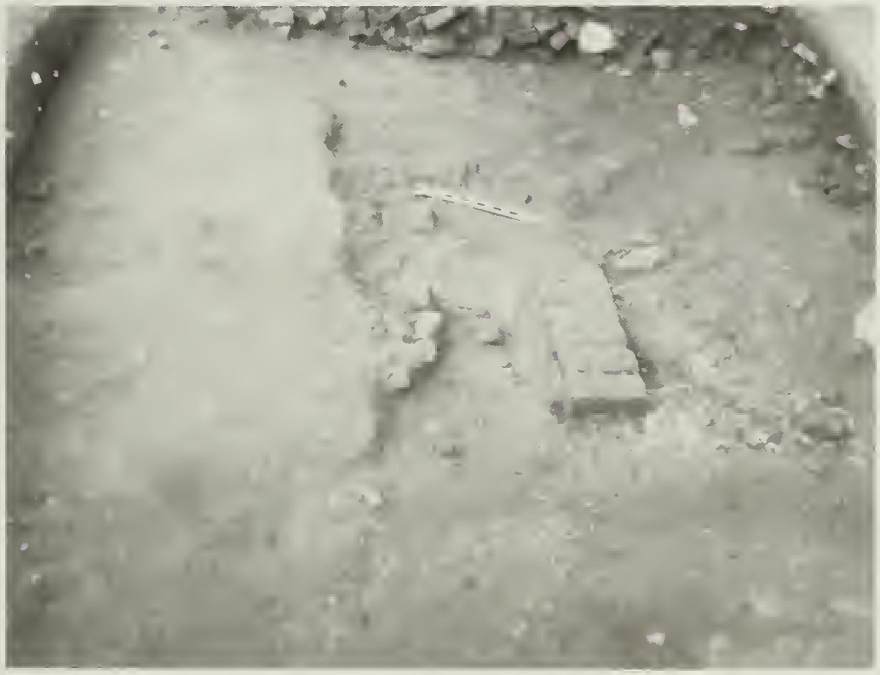


Figure 120. Feature 2 brickwork.
Looking east.

Feature 3

This feature is a trash pit measuring 3.7 feet by 3.2 feet with a maximum depth of 2.4 ft. (Figure 20). It was intrusive into Structure 3, but dates to the 18th C. The top portion of Feature 3 had been disturbed by the later Feature 4. Feature 3 cuts through soil stains which may have been contemporary with Structure 3.

Feature 4

Feature 4 is a large filled-in trench or ditch measuring c.8 ft. in width (north-south) by a minimum of 18 to 20 ft. in length (Figure 20). The feature is more than 5.2 ft. in depth, and is characterized by fill of six or more strata. Comparatively few artifacts were found in the fill, but several 19th C. sherds were recovered midway into the trench.

The south edge of Feature 4 is c.2 ft. to the north of Feature 1 and nearly 7 ft. to the north of Feature 2. Feature 4 cut through Structure 3 and bisected two maroon soil stains and two in situ brick areas at the floor level of Structure 3. Feature 4 also bisects Feature 5 and covers or is above Feature 3. In sum, the construction sequence, from oldest to youngest, is as follows: Structure 3; Feature 1 (contemporary with the pottery factory); Feature 2 (same); Feature 3 (later than the pottery factory, but 18th C. in date); and Feature 4 (19th C.).

Feature 5

This feature represents a partially excavated trash deposit consiting of black soil and artifact debris, and measuring 0.8 ft. in thickness and minimally 10 ft. in length (east-west) and 4 ft. in width. Numerous wine bottle fragments, delftware, Rhenish stoneware, etc., were recovered, and the feature can be dated to the third quarter of the 18th C. Feature 5 postdates Structure 3 and is 1.5 ft. above the Structure 3 floor level.

Feature 6

Feature 6 is a patch of brickwork, measuring a maximum of 4 ft. by 3.2 ft. and one brick in thickness. (Figures 20,121). The

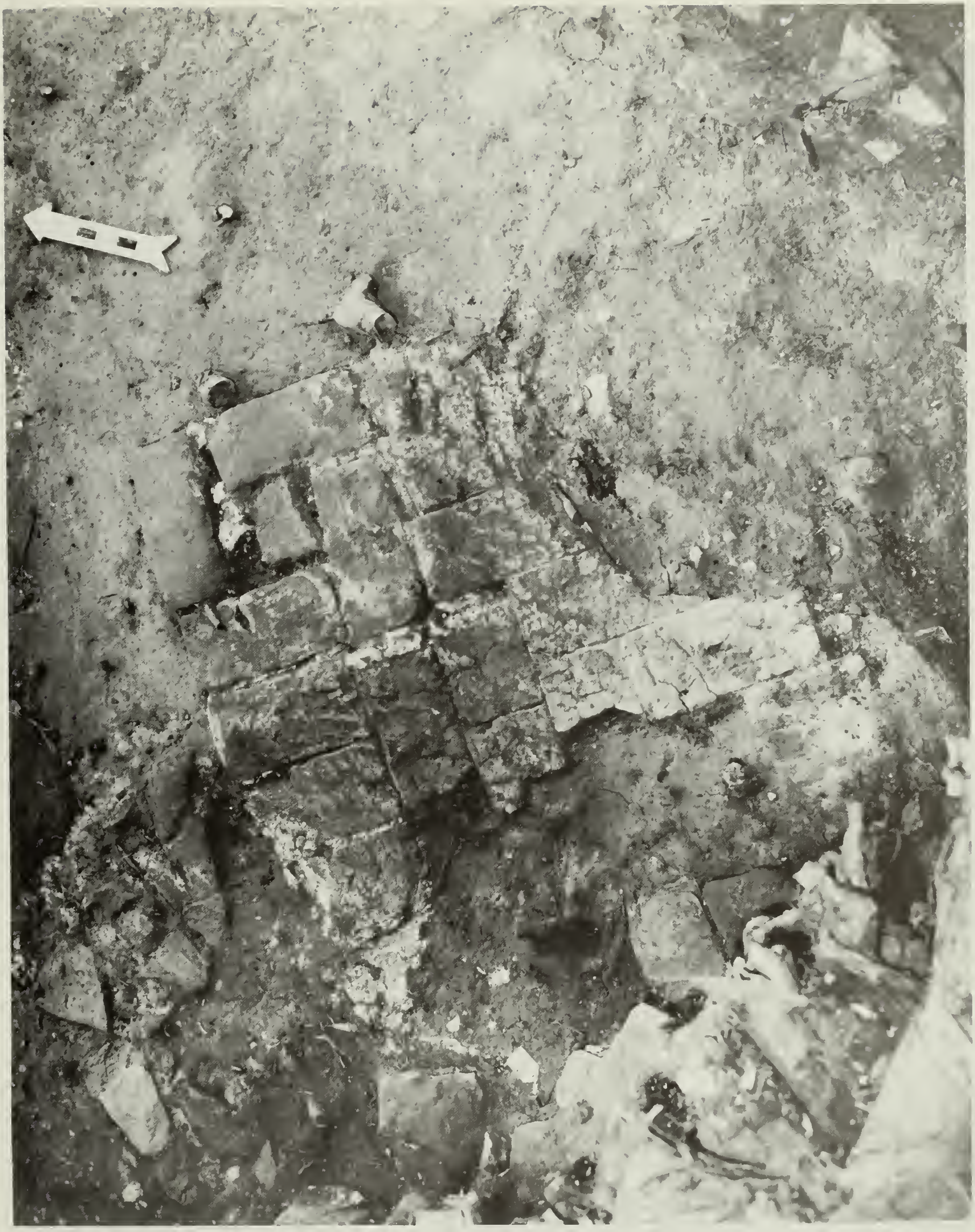


Figure 121. Feature 6, plan view.

feature had been disturbed, so that in only a 2.5 ft. by 2.0 ft. area are the bricks in situ. The function of Feature 6 is unknown.

Isolated small patches of in situ brickwork occur to the east of Feature 6 and also a few feet to the north and south of Feature 3. All may be contemporary with Structure 3, although the orientation of these brick, together with Feature 6, are not at right angles to Strucutre 3.

Structure 4

Seventeen feet to the west of Structures 1 and 2 excavations revealed the remains of Structure 4, a post-in-the-ground structure measuring 32 ft. (north-south) by 16 ft. The evidence for the house consists of two parallel rows of equally spaced postmolds (8 ft. between posthmolds, north-south) within larger postholes, the rows being 16 ft. apart. (Figures 20,122,123). The east row consists of five post holes (numbers 1-5). The west row was not completely excavated and only three post holes (numbers 6-9) have been definitely traced (posthole 8 was disturbed). In the middle of the structure, between postholes 3-4 and 8-9, a disturbed brick rubble area was found. It measures seven feet (north-south) by six feet and probably represents basal remnants of the Structure 4 fireplace.

The nine postholes excavated thus far are uniform in size and character. They are squarish in shape, measuring c.3 ft. to 3.5 ft. square and 2.0-3.0 ft. in depth. The fill of each post hole contains several strata of mostly sterile sand.

Each posthole has one postmold within it. Only one postmold has been completely excavated, and it measures a minimum of 0.8 ft. in diameter and is nearly 3 ft. in depth. Each postmold contained pottery fragments, brick fragments, iron nails, and other chunks of marl.

Additional soil stains and smaller square postmolds were found within Structure 4.

Structure 4, a wooden building contemporary with the pottery

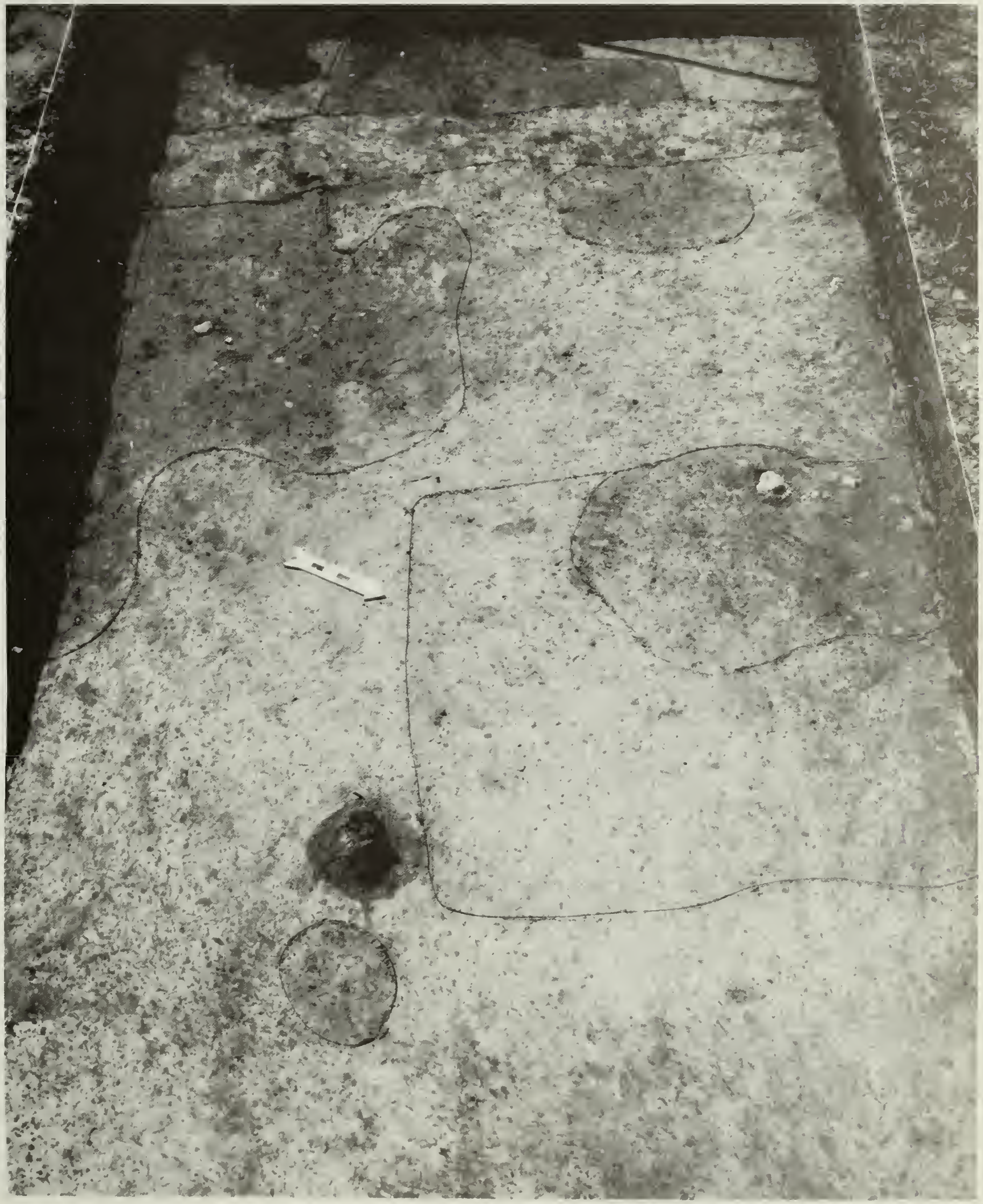


Figure 122. Structure 4 posthole-postmold. Looking west.

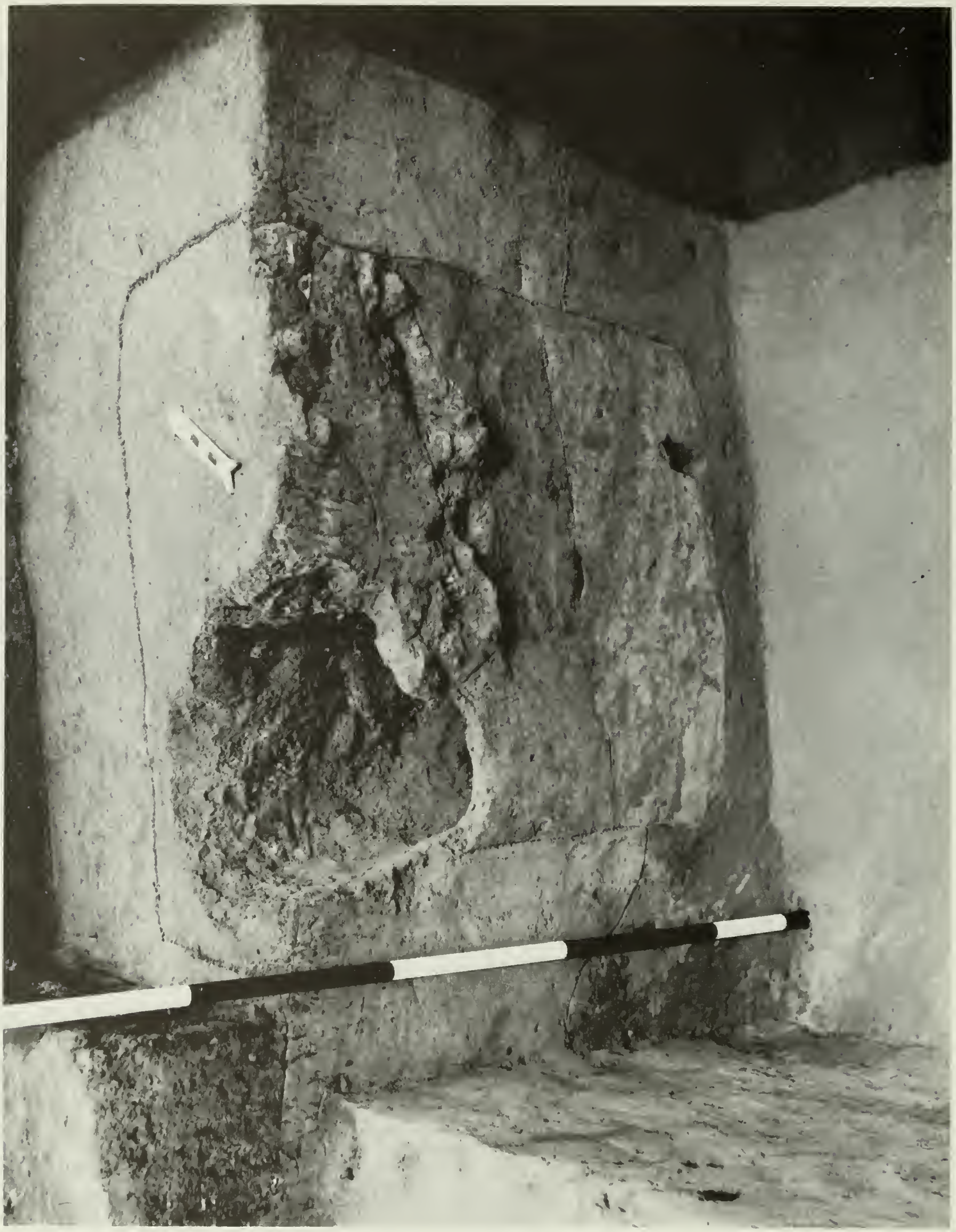


Figure 123. Structure 4 posthole-postmold, section view.

operation, may have been another workshop or storage building for the factory, or it could have served as a dwelling.

Structure 5 and Area

In this area, five units were excavated to subsoil level and two other units were only partially completed. (Figures 19,124). A variety of testing methods were employed, including 2x2 ft. test pits, 10 ft. by 4 ft. test trenches, and eventually 10 ft. by 10 ft. squares. The use of such a mixture of excavation procedures was due primarily to the unexpected depth of fill within this section of the site.

Throughout most of this area, the ground surface was covered by a densely packed layer of gravel, laid down in the late 1960's for a driveway. This gravel and the associated topsoil level varied between 0.5 ft. and 1.2 ft. in depth, and contained an assortment of 18th C. to 20th C. material. Beneath this, there occurred an extremely thick grey to brown sandy fill, that in most cases extended to subsoil. It incorporated from 3 to 5 different sub-levels or strata that were differentiated from one-another by the degree of yellow sand, clay mottling, or brick and oyster shell flecking present. In general, the fill tended to be more solidly grey as it approached ground surface, and conversely it contained greater quantities of mottle sandy clay and brick and shell flecking as it approached subsoil. Large quantities of Yorktown pottery were recovered throughout this level as well as a considerable amount of mid-19th C. material, primarily molded bottle and window glass and whitewares. (Figure 125).

In the two trenches 26K and 26L and the adjoining square 26S, a fairly thick wash lens overlaid the subsoil floor beneath the sand fill. It consisted of a grey sand intermixed with charcoal, charred and uncharred bone, molded window glass, and whiteware, ranging between 0.1 ft. and 1.0 ft. in thickness. The len's texture and manner of deposition (in thin washes or layers) were very similar to the washes encountered on the floors of the siege

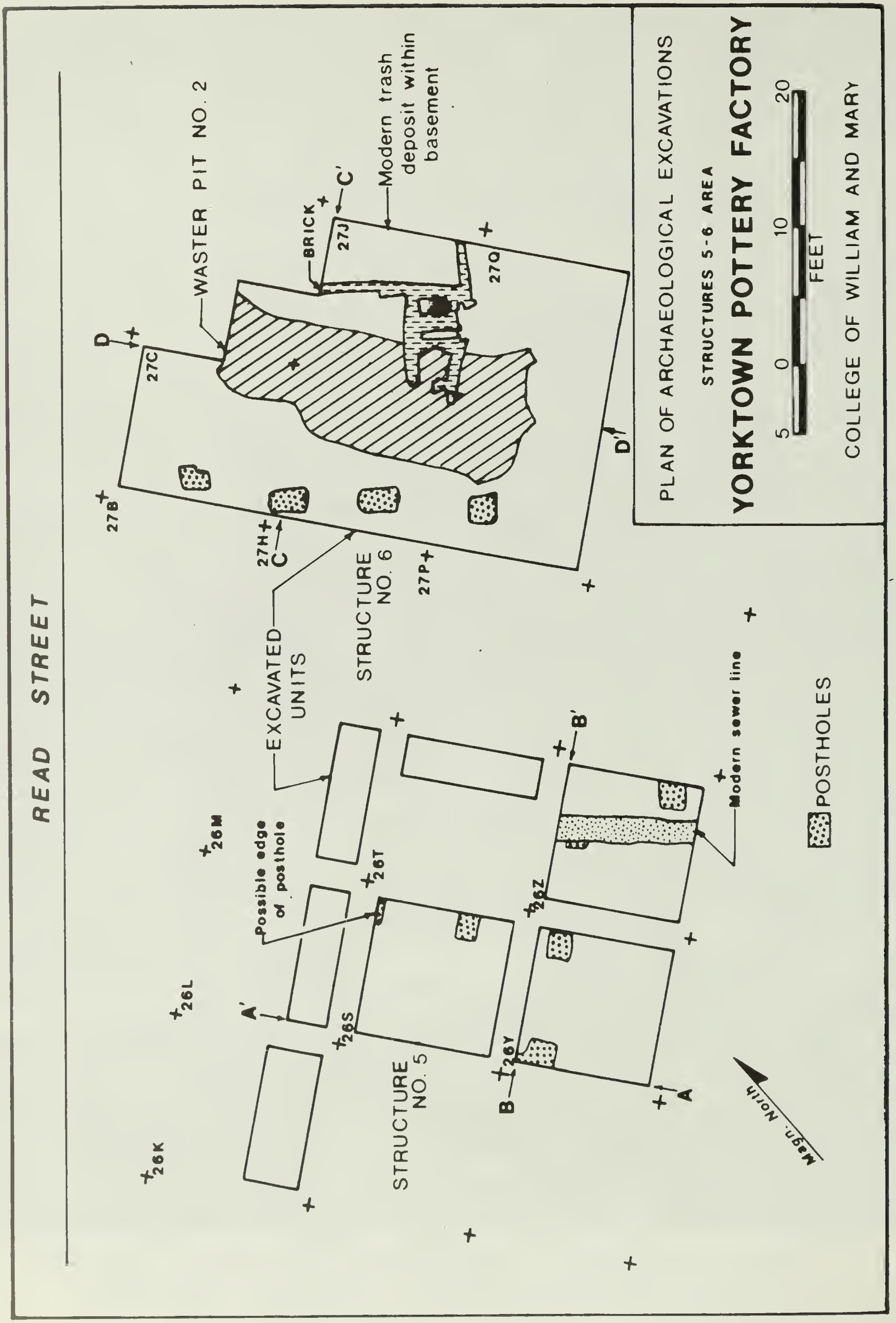

READ STREET
WASTER PIT NO. 2
Modern trash deposit within basement
BRICK
C'
D
27C
27J
27Q
27B
27H
C
27P
D'
STRUCTURE NO. 6
EXCAVATED UNITS
STRUCTURE NO. 5
Possible edge of posthole
26M
26L
26K
26T
26S
26Y
26Z
A'
A
B
B'
Modern sewer line
POSTHOLES
Magn. North
PLAN OF ARCHAEOLOGICAL EXCAVATIONS
STRUCTURES 5-6 AREA
YORKTOWN POTTERY FACTORY
5
0
10
20
FEET
COLLEGE OF WILLIAM AND MARY

FIGURE 124

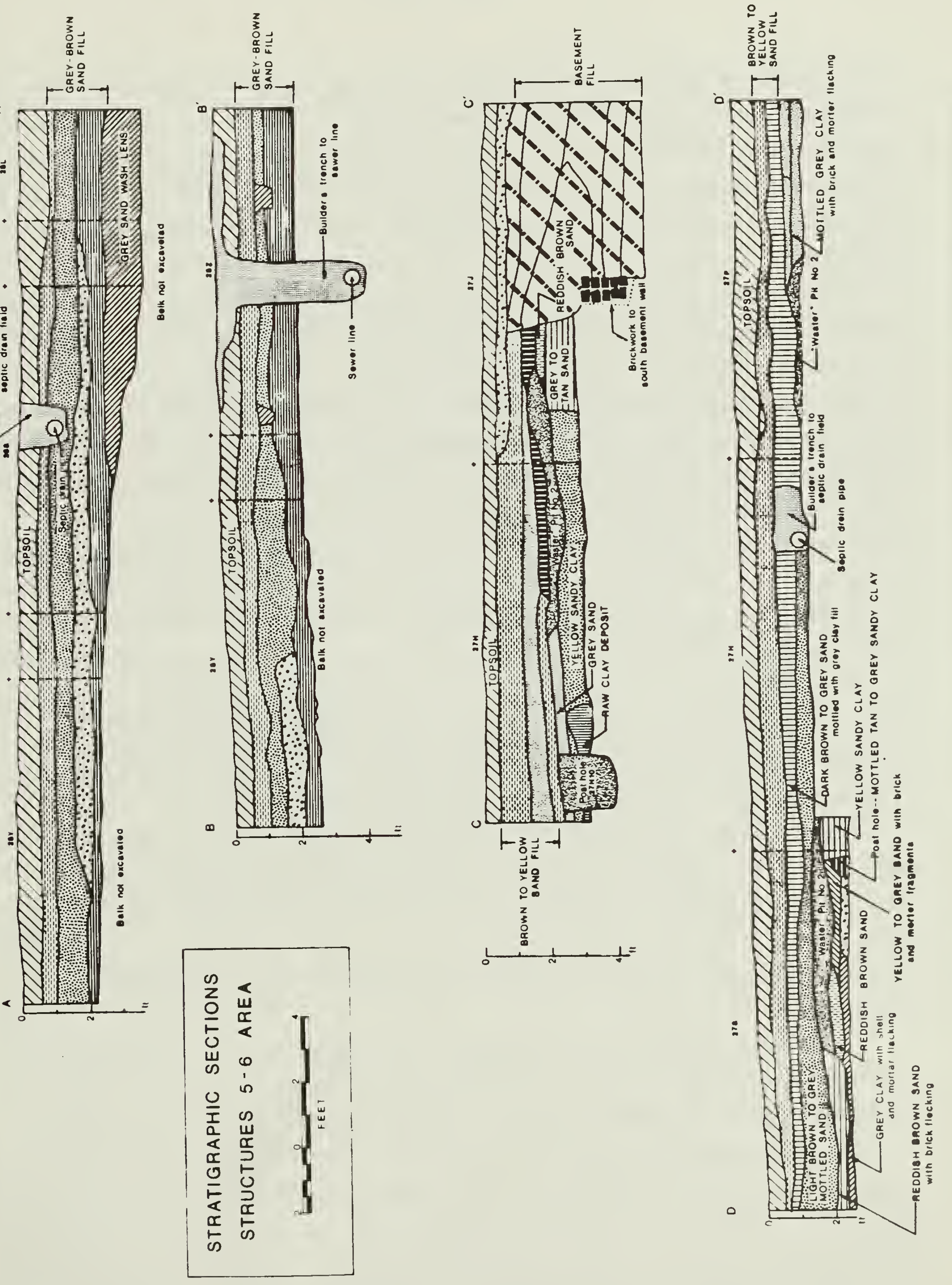

STRATIGRAPHIC SECTIONS
STRUCTURES 5-6 AREA
FEET
0
2
4
A
A'
B
B'
C
C'
D
D'
GREY-BROWN SAND FILL
TOPSOIL
GREY SAND WASH LENS
Builders trench to septic drain field
Septic drain
Belk not excavated
Builders trench to sewer line
Sewer line
BASEMENT FILL
REDDISH BROWN SAND
Brickwork to south basement wall
GREY TO TAN SAND
Waster Pit No 2
YELLOW SANDY CLAY
GREY SAND
RAW CLAY DEPOSIT
Post hole
BROWN TO YELLOW SAND FILL
MOTTLED GREY CLAY with brick and morter flacking
"Waster" Pit No 2
Builders trench to septic drain field
Septic drain pipe
DARK BROWN TO GREY SAND mottled with grey clay fill
YELLOW SANDY CLAY
Post hole--MOTTLED TAN TO GREY SANDY CLAY
YELLOW TO GREY SAND with brick and morter fragments
REDDISH BROWN SAND
GREY CLAY with shell and mortar flecking
REDDISH BROWN SAND with brick flecking
LIGHT BROWN TO GREY MOTTLED SAND
Waster Pit No 2
ft

FIGURE 125

line, connecting trenches, batteries and redoubts during the excavations of the Yorktown Battlefield.[1] Both for this reason and the mid-19th C. context of its material, it is likely that this portion of the Structure 5 area served as some type of military fortification dating to the Civil War period, presumably Confederate.

Only three groups of features intrude into the subsoil floor. These include a very shallow series of plowscars, a line of fairly recent postholes, and a second set of larger postholes related to the pottery producing period. The plowscars partially extend across squares 26S and 26Y, running in an east-west orientation. Although they do not have much to offer on the interpretation of the site per se, their presence at approximately 3 ft. below present grade clearly indicates that quite a bit of filling has occureed in this area. Normal plow zone depths were and still are seldom over 1 ft. below grade. It would seem likely that sometime during the 19th C. the ground surface in this area was raised by the addition of nearly 2 ft. of fill. The temporal relationship between the plowing activity and the probable Civil War fortifications has not been adequately determined, although the plowscars appear to pre-date the wash lens.

The more recent set of postholes occur as an irregular line of small, squared-off stains with some evidence of secondary, replacement posts. Although none of these features have been excavated, they are most likely 19th or early 20th C. in context and may be part of a fence row or similar type of insubstantial enclosure.

The third and final feature is Structure 5 - six large postholes dating to the second or third quarter of the 18th C. (Figure 124). Except for one, the postholes are in alignment with each other, set on 8 ft. centers, indicating the presence of a post structure. The odd, unaligned member suggests either an addition or wing may have been attached to the primary building or the presence of a totally separate post structure. Only one of the postholes was completely excavated, because it had been partially destroyed by sewer line construction. The remaining fill consisted of mottled grey to orange sandy clay with large fragments of bisque milkpans and jugs. The posthole measured 1.4 ft. in depth below the subsoil level (4.3 ft. below ground surface) and 2.0 ft. in width at its surface. In four of the remaining five postholes, the surface dimensions also reflect this same 2 ft. width. The sole exception to this is somewhat larger and possibly denotes an adjoining, secondary post placement.

As a final note on the Structure 5 area, two additional test trenches were partially excavated. However, the location of a probable septic tank, its drainfields and the continuation of the sewer line toward Read Street discouraged further work.

Structure 6 and Area

Five 10 ft. by 10 ft. units and one 4 ft. by 4 ft. unit were excavated in this area.

19th and 20th C. Contexts

The same type topsoil/overburden levels encountered in the Structure 5 area were also present in the Structure 6 area. Both strata appear to date to the later 19th C. and early 20th C. The topsoil was the usual non-descript humus from 0.3-0.7 ft. in depth.

The underlying fill consisted of a variety of interelated levels.

In addition to the general fill deposit, two features also fall within a 19th-20th C. context. Within square 27J, a brick-lined basement with a bulkhead entrance cuts through a major portion of the square. The brickwork throughout is totally dry-laid, meaning that no bonding material other than a sand clay was used. The bulkhead entrance consists of seven irregularly spaced brick steps leading down to the basement floor. (Figures 124,136,137,138,140-142). Lining the entry are two sidewalls, each one brick wide, laid in a very irregular manner without any specific bonding pattern. This haphazard construction is also carried over to the partially exposed east and south basement walls. These walls are both one brick wide but with a very unusual manner of construction. The walls interior face use half and whole bricks laid stretcher to stretcher in a vernacular style of American or common bond, while the exterior portions (especially along the south wall) are laid up in a jumble of half bricks and brick bats. The unique aspect of these walls concerns the fact that the interior and exterior faces are not bonded together at all. Instead they are built as two separate one-half brick wide sections set side by side to form a single wall. Not only does this produce a very unsubstantial structural component, but it raises serious doubts as to whether or not this type of wall could carry any above ground weight. Such a consideration strongly suggest that the basement was either a separate, internal part to a large more substantial structure or that it simply functioned as a root cellar or similar type substructure.

An orange sandy clay subsoil formed the floor of the basement at a depth of approximately 5 ft. below the ground surface. The basement's interior fill comprised a host of various levels, including mottled brown sand, grey coal ash, burnt and unburned oyster shells, dark grey to black sand, white plaster and sand mortar fragments, and a thin sand wash lens above the subsoil floor. Intermixed with this was a vast quantity of modern debris - mold made bottles, cast iron stove parts, fragments of a Singer sewing machine, plastic combs, iron kitchen utensils, ironstone plate and bowl fragments, etc. Based on the personal recollections of the previous owner, Mr. Childrey, who remembers breaking bottles in the basement as a child, this fill apparently dates to the 1930's or 1940's. The basement itself, however, is somewhat earlier, possibly late 1800's.

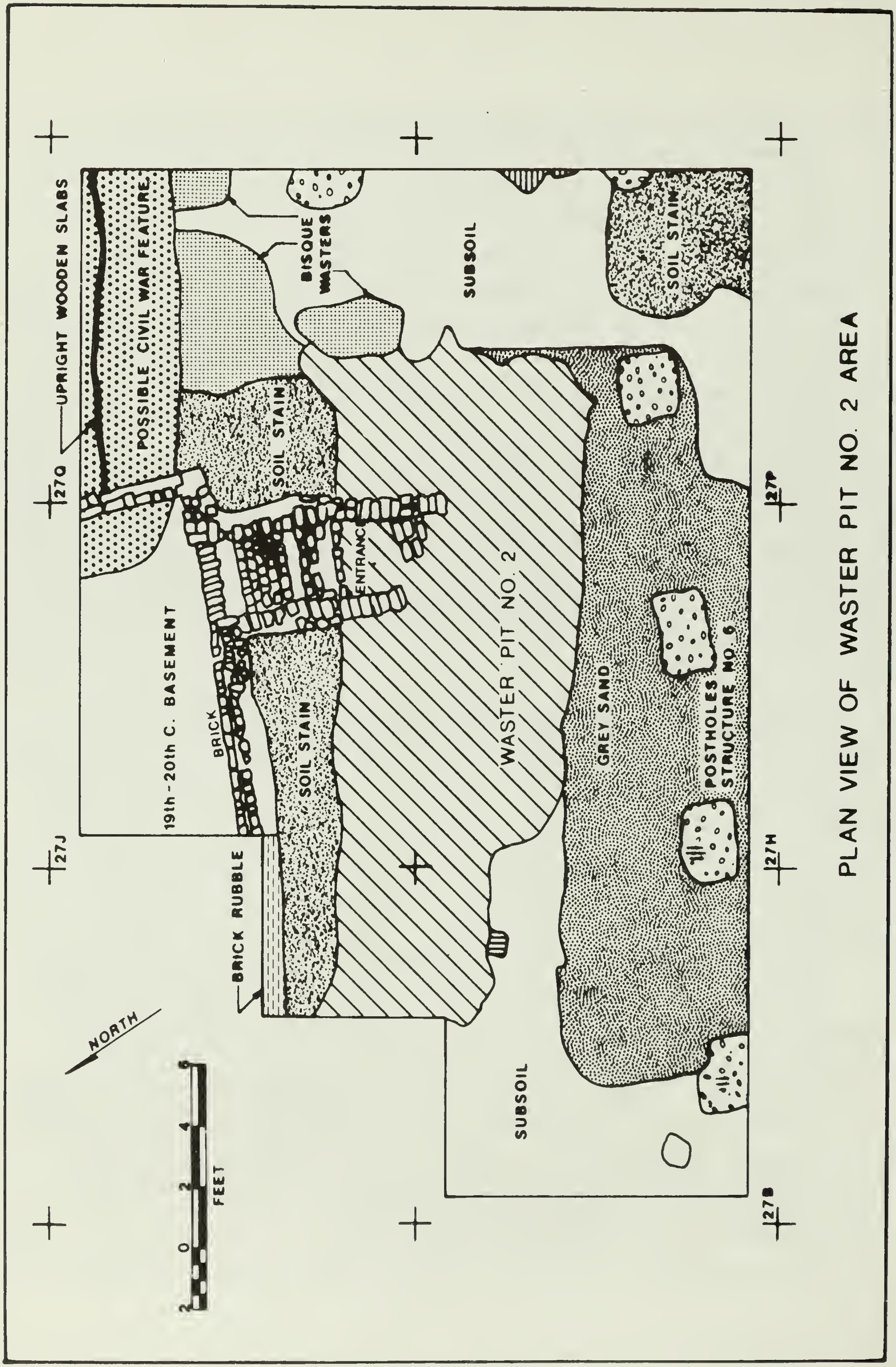
The second 19th C. feature extends along the northeast edge of our excavation area in square 27Q and 27J, and undercuts the southern wall of the above-mentioned basement. This feature has been tentatively identified as a Civil War trenchwork of unknown purpose. A 33 ft. by 13.4 ft. section of the feature was exposed and excavated down to an average depth of 5 ft. below ground surface without encountering subsoil. The "trench" fill consisted of layered orange to tan sandy clay interstrewn with brick fragments and a small amount of hard fired whiteware and molded bottle glass. Also included in the middle of the fill was a puzzling section of upright wooden slabs that had been fashioned into a type of temporary wall. What purpose or function this wood served has not been adequately determined.

Yorktown Pottery Factory Context

Beneath the 1.0 ft. to 2.5 ft. of overburden, a concentration of early to mid 18th C. features was found. These include a very shallow waster pit, three pockets of thickly packed bisque ware, two series of postholes, a large clay deposit, a section of a walkway or floor support built of wooden planks and joists, and a possible trash pit.

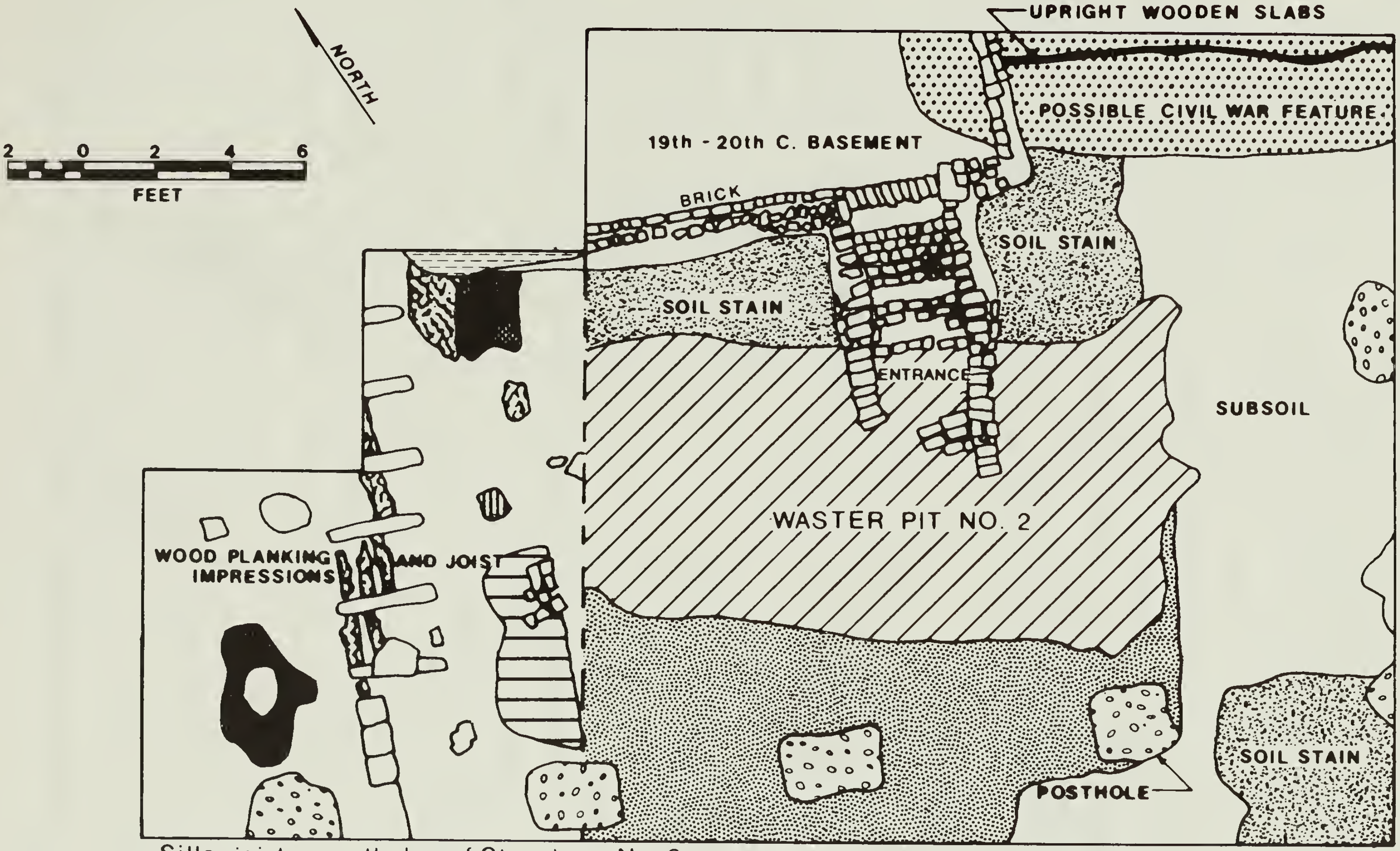
Waster Pit #2. The term pit is used loosely in this instance, as waster lens might be more appropriate. The feature is defined by a concentration of glazed and unglazed earthenwares, bisque and salt glazed stonewares, stove tiles, flooring tiles, marl and brick. At its surface, the pit measures an average of 8 ft. north-south and 23 ft. east-west, and intrudes into each of the six excavation units. (Figures 124,126,127,136-139).

The pit is very shallow, ranging from a minimum of 0.3 ft. to a maximum of 0.6 ft. Furthermore, the pit does not cut into the subsoil at all. Instead it intrudes into a combination of grey and reddish-brown sand levels dated to the second quarter of the 18th C. Also, a large amount of building material, present in the form of brick and marl, further negates its sole function as a deposit of kiln waste. These factors suggest that this feature could be the product of a secondary disposal pattern. The feature was not completely excavated.



PLAN VIEW OF WASTER PIT NO. 2 AREA

FIGURE 126



Sills, joists, postholes of Structure No. 6

PLAN OF WASTER PIT NO. 2 AREA WITH SILLS AND JOIST STAINS EXPOSED

FIGURE 127

Bisque Ware Deposits (27Q10 and 27Q11)

Three fairly small bisque ware deposits were found directly adjacent to the waster pit's eastern corner in square 27Q. (Figures 126,138). Although they do not cover a large surface area, the deposits reflect a highly concentrated grouping of 'experimental' bisque pottery that apparently includes both test shapes and test clay mixtures. (Figures 280-288). Each of the three bisque areas measured between 0.9-1.0 ft. in depth. These deposits are much more representative of kiln waste in their relative quantity of pottery fragments per given volume and in their uniformity of ware type than the Waster Pit No. 2 described above.

Postholes

Along the south and east edges of the Waster Pit (no. 2) excavators uncovered a series of 6 primary postholes (with a possible 7th in square 27C) that delineate two probable exterior walls of a post structure. (Figures 124,126,127). They are set on 8 ft. centers east to west (identical to the spacing of the postholes in other post structure areas) and 10 ft. centers north to south. The presence of these postholes in relationship to the waster pit strongly suggest that the waster material was confined to this structure's interior area. If so, then the post building predates the deposition of the pottery but is contemporary with the deposition also.

As shown in Figure 127, certain other features in 27B and 27C appear to be related to the post structure. These include a large clay deposit (27B15a) and a wooden plank-joist arrangement. It is very easy to speculate that this material defines, at least in part, the potting activities that were being housed by the structure, specifically clay preparation - mixing, wedging, etc. Also the alignment of thse postholes does not parallel the other previously defined workshops, kilns, or post structures. This factor could indicate a different building phase for this particular structure (either earlier or later) in regard to the other known structures.

Beyond the large primary postholes, a second series of three smaller postholes occurs in square 27B. They are directly aligned with one another, although irregularly spaced. Also they are parallel to the larger postholes, offset by 8 ft., and may represent interior post supports.

Trash Pit? (27P9)

This questionable feature, tentatively identified as a trash pit, cuts into the southern corner of square 27P with only a 4.7 by 5.0 ft. portion of its surface exposed. Its fill consists of dark grey sand with heavy concentrations of brick and pottery fragments. From the placement of the intrusive post hole of Structure 6, the feature apparently predates the post structure mentioned above [identified as soil stain in Figures 126 and 127].

Wood Planking and Joists (27B24 and 27C11)

Directly above the subsoil floor in squares 27B and 27C, a series of wooden planks and joists were located. (Figure 127). They appear to be a walkway or flooring support for a work area. The planks rest directly on the undelying joists in groups of short sections (measuring from 1.5 ft. to 1.8 ft) composed of 4 to 5 planks set side by side. The 6 exposed joists, or more accurately the joist impressions, are spaced 2.0 ft. apart, center to center, from each other over a distance of 9.9 ft. They range from 0.3-0.4 ft. in width and measure 2.6 ft. in length. The planks and joists are directly aligned with an in situ group of 3 square flooring tiles (each 0.8 ft. square), suggesting that these tiles were somehow a part of the same walkway or flooring arrangement. It should also be noted that all this material was found directly beneath a relatively thick lens of raw potting clay (0.4 ft. in thickness), set at a 90° angle to the south wall of the post structure (Structure 6). This would seem to add further corroborative evidence for interpreting the raw clay, planks, joists and tiles as an integral component of the post structure itself and its related potting activities.

The clay level mentioned above (27B15a) also included a small compact deposit of earthenware milkpans and stoneware mugs. The earthenwares [or stoneware?] were of particular interest in that a small number of the vessels had not been completly fired to the curing temperatures of c.560° C. Instead, portions of their mid-bodies still remained in the raw clay state.

Waster Pit #1

The first major feature excavated at the site in 1966 was a pit which contained locally made pottery. This feature was the first conclusive evidence that a pottery manufacturing site had indeed been present in Yorktown in the Lot 51 and Lot 55 area.

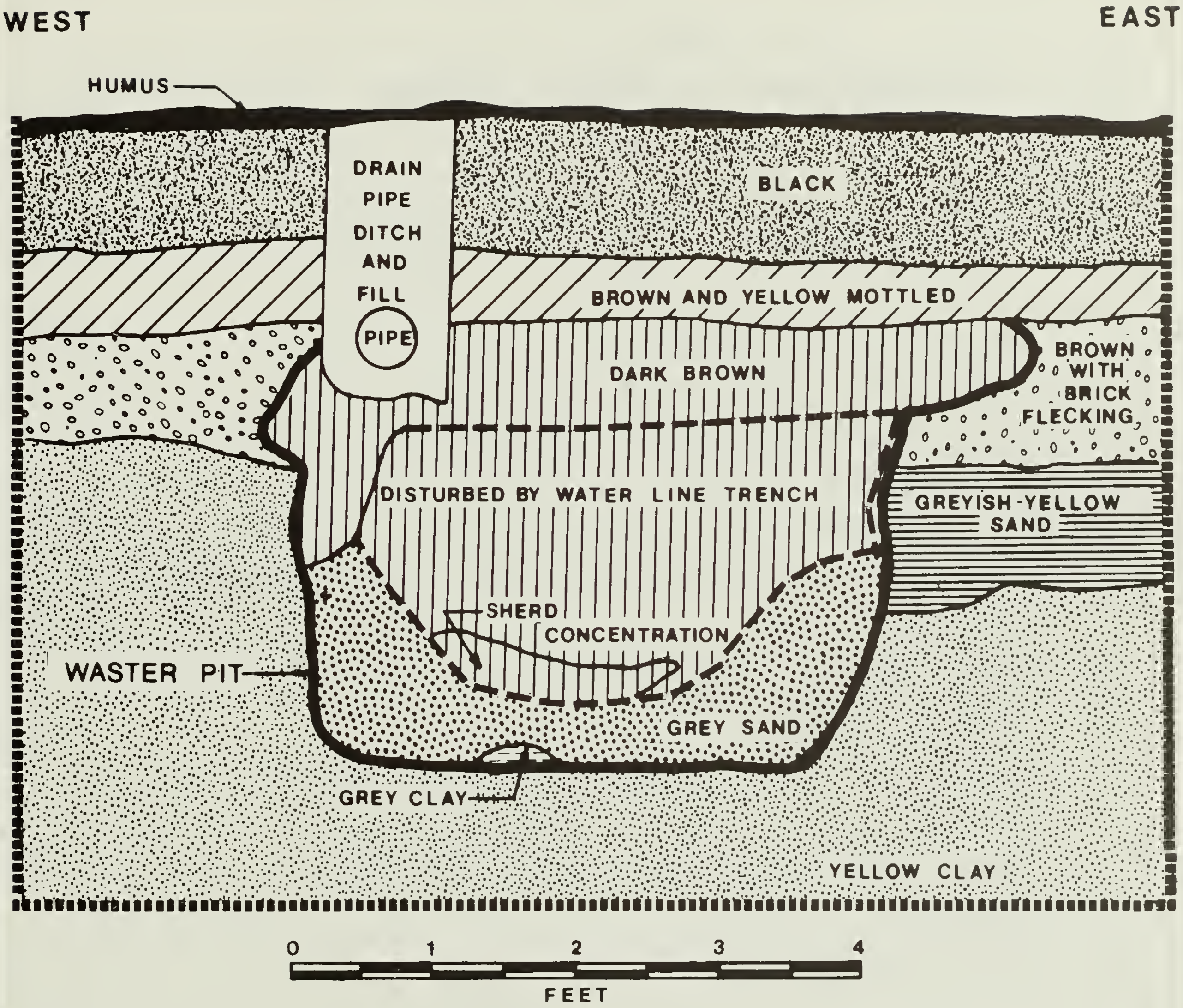
The pit was originally 'discovered' by workers laying a water pipe from Read Street to the house of Mr. and Mrs. Childrey. The water pipe ditch had been dug through the southwest side of the pit and had exposed large quantities of sherds, some representing nearly complete pots.

The pit, as later excavated, was found to be roughly circular in plan, measuring c.4.7 ft. in maximum diameter and 3.4 ft. in maximum thickness or depth. The pit had sloping side walls with a flat bottom that measured c.2.5 ft. in diameter. The surface of the pit was 2.5 ft. below present ground level, reflecting a buildup of soils in this area of the site in the 19th-20th C.

Originally the pit had been dug into a filled-in squared hole with at least one vertical side and very flat bottom. The function of this hole is unknown, as is the date of excavation and filling. (Figures 128-135).

The fill of the pit consisted of layers of ash-charcoal, fire-burnt sands, and various brown and grey colored lenses. Although local pottery was found in nearly all levels, one main pottery deposit was situated toward the mid-point of the pit. It was from this deposit that numerous whole to nearly whole pots and the majority of ceramics were uncovered.

Tables 2 and 3 summarize the ceramic finds from this deposit. Of the 868 sherds (and pots) recovered, the vast majority were earthenware (92%), with the majority of these being bisque



WASTER PIT NO. 1, CROSS-SECTION

FIGURE 128

Table 2

WASTER PIT 1: CERAMIC CONTENTS

Earthenware	Stoneware
Milk Pans -.45 bisque 35 glazed	
Large Bowl with stains*	
Bowls, medium sized	Bowls
Porringers	
Bottles	
Mugs	Mugs (1 bisque mug with white slip and iron oxide)
Platters, glazed	
Small rimmed bowl or plate with 2 incised lines on rim	
Colanders	
Storage Jars	
Cream Pots	
Saucepan	
Green glazed sherd	
	Chamber Pot
	Pipkin
	Saggars and Lids

*bowl probably used to mix slips

earthenwares (61%). Only 8% of the total were stonewares, mostly salt glazed.

Of the identified ceramics (31% of total), two earthenware forms constituted 88% of the pit deposit: milkpans (55%) and bowls (33%). It is interesting to note that the majority of milkpans were bisque (83%), while the majority of bowls were glazed (85%).

Even though two forms were prevalent, a total of 12 forms and kiln furniture, bisque and/or glazed, were represented in the pit, totaling 12% of the total identified ceramics. The other forms are as follows: bottle, chamber pot, colander, cream pot, jar, mug, platter, floor tile, and kiln furniture (only one sherd).

The following whole to nearly whole pots were found in the pit:

8 milkpans, both glazed and bisque
7 bowls, bisque and glazed
1 saucepan, glazed
1 pipkin, salt glazed stoneware
1 chamber pot, salt glazed stoneware

It is very probable that the pit in question was a waster pit, i.e., a convenient nearby place for the potter to dump kiln wasters - broken pots as well as defective pots. (Figures 144,145). This function is suggested by the following evidence: 1). the presence of the pit on a pottery manufacturing site; 2). the presence of a concentration of broken and defective pots in a purposely dug hole in the ground; 3). the location of the pit only 100 ft. from the kilns.

The whole to nearly whole pots found in the pit were defective in some way - cracked, broken handles, portions of the glaze burned off, etc. It is seemingly apparent that imperfect ceramics were not sold to the consumer.

The presence of complete pots in the pit signifies two things: 1). the pit, as we now know, was relatively close to the kilns, as one assumes that if pots were taken from the kiln and transported to a distant location, they would break; 2). the deposits

TABLE 3

WASTER PIT I: SUMMARY OF CERAMIC DEPOSIT

1). Earthenware	92%	(800 sherds)
Stoneware	8%	(68)
	100%	(868)
2). Bisque Earthenware	61%	(485)
Glazed Earthenware	39%	(315)
	100%	(800)
3. Bisque Stoneware	9%	(6)
Glazed Stoneware	91%	(62)
	100%	(68)
4. Identifiable Ceramics*	43%	(374)
Unidentifiable Ceramics	57%	(494)
	100%	(868)
5. Identifiable Earthenware	44%	(353)
Unidentifiable Earthenware	56%	(447)
	100%	(800)
6. Identifiable Stoneware	31%	(21)
Unidentifiable Stoneware	69%	(47)
	100%	(68)

*Identifiable as to shape

found in the waster pit represent a portion of one or more kiln firings taken directly from the kiln to the pit, which accounts for the lack of breakage. However, one cannot be sure of the latter, as defective pots from several kiln firing might make up the contents of the waster pit deposit.

One can be relatively sure that the pots found in the waster pit are contemporary, i.e., they were being manufactured at the same time. The waster pit is the only means of obtaining this information for the entire site. It appears as though stonewares and earthenwares were made at the same time, and not during separate periods.

FOOTNOTE

1. Barka, Norman F., Archaeology of the Yorktown Battlefield, Yorktown, Virginia, Southside Historical Sites, Inc., Williamsburg, 1976.

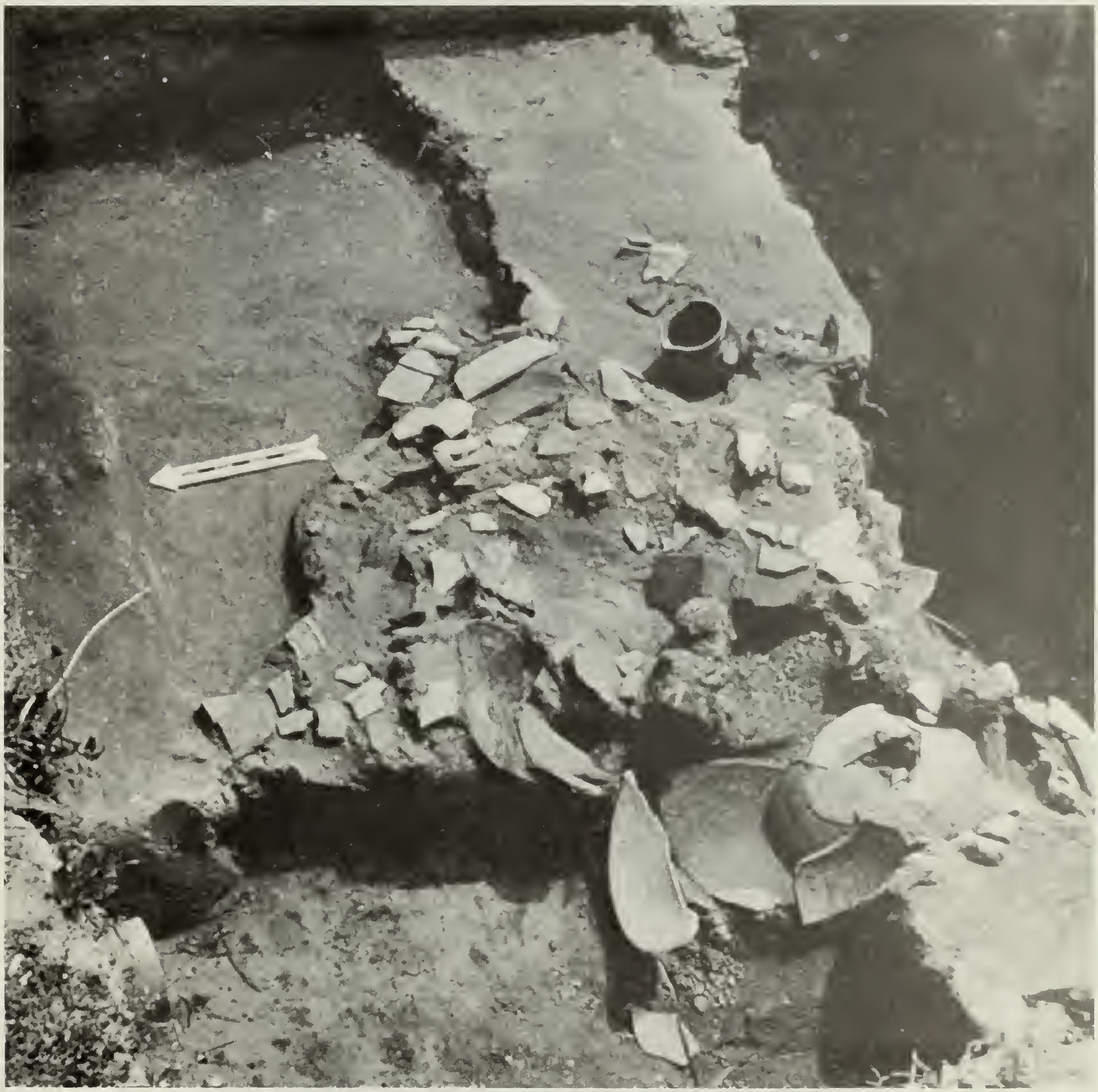


Figure 129. Waster Pit No. 1, surface view. Looking east.

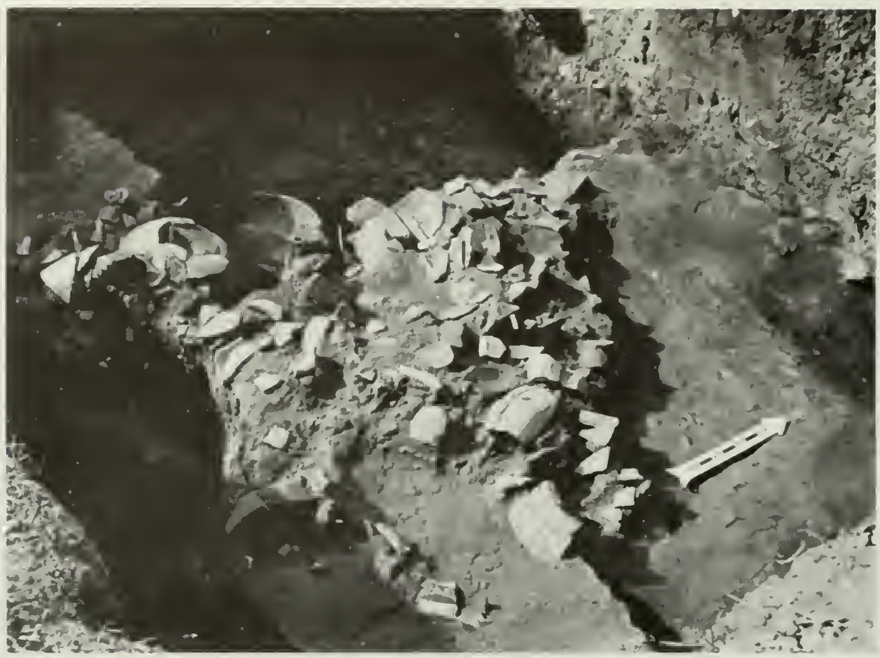


Figure 130. Waster Pit No. 1, looking northwest.

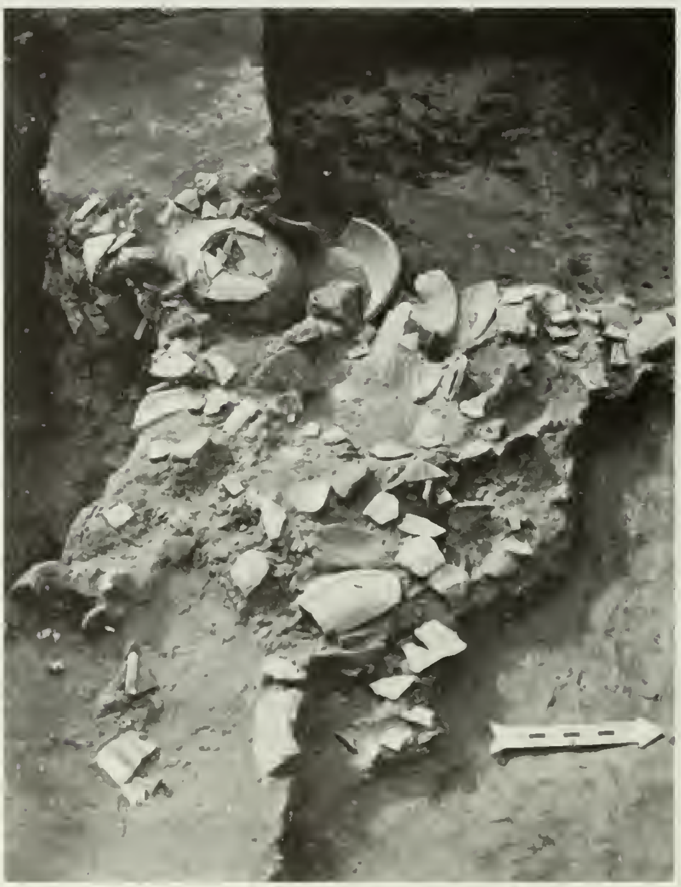


Figure 131. Waster Pit No. 1, looking west.

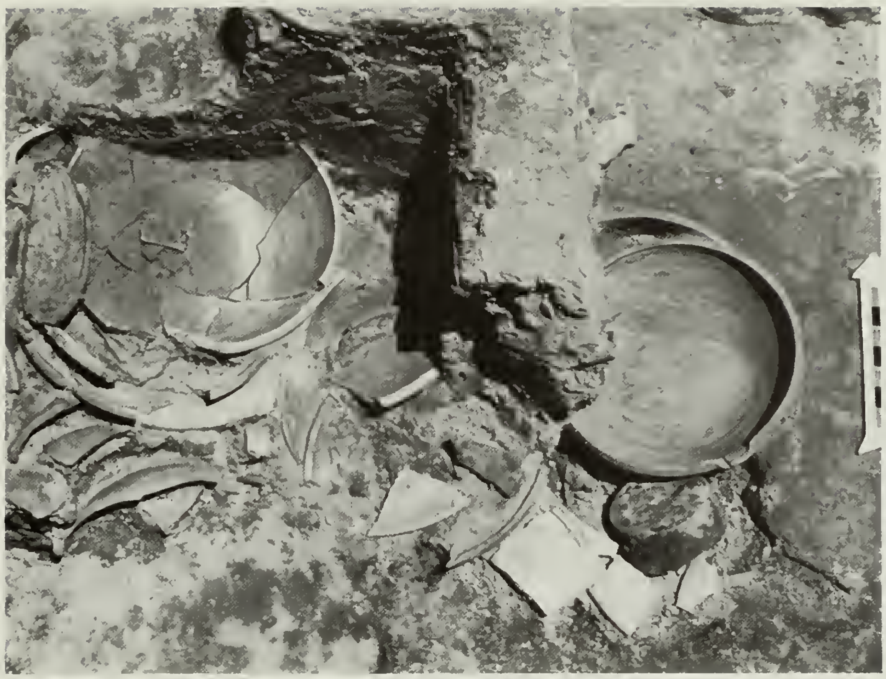


Figure 132. Waster Pit No. 1, milkpan concentration.

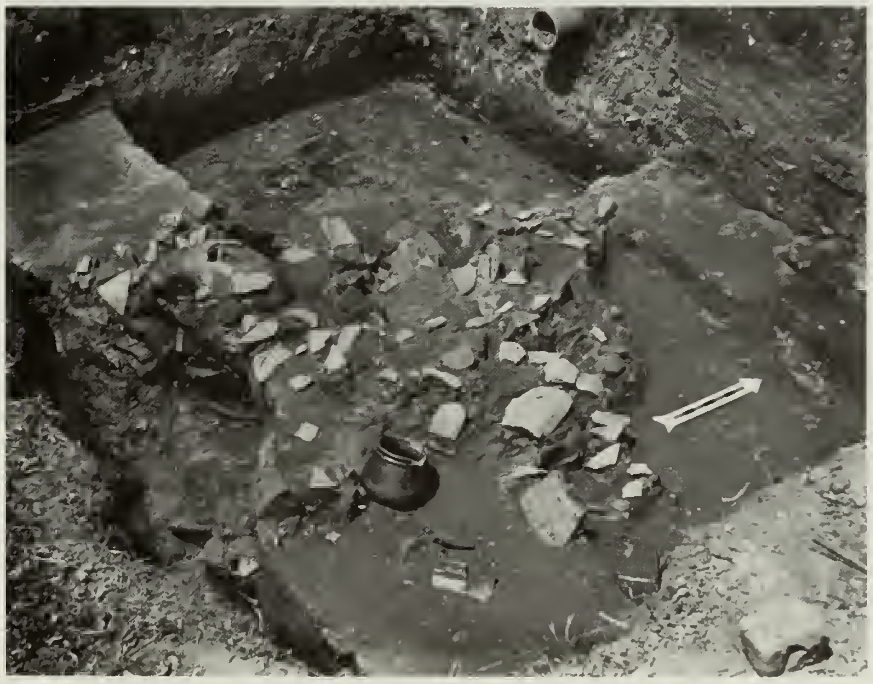


Figure 133. Waster Pit No. 1. Photo taken prior to Figure 130.

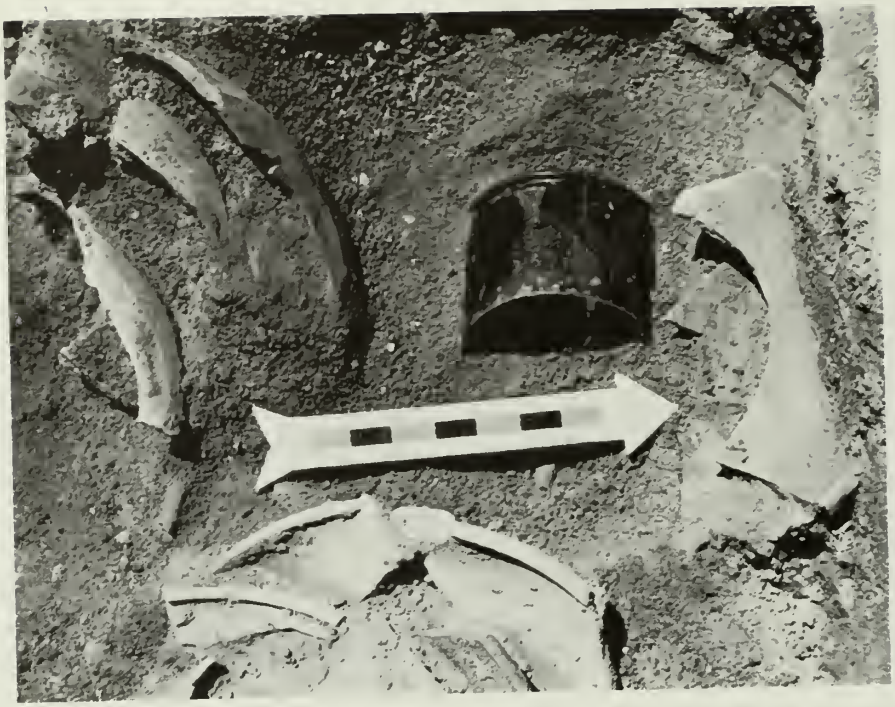


Figure 134. Waster Pit No. 1, lead glazed cream pot.

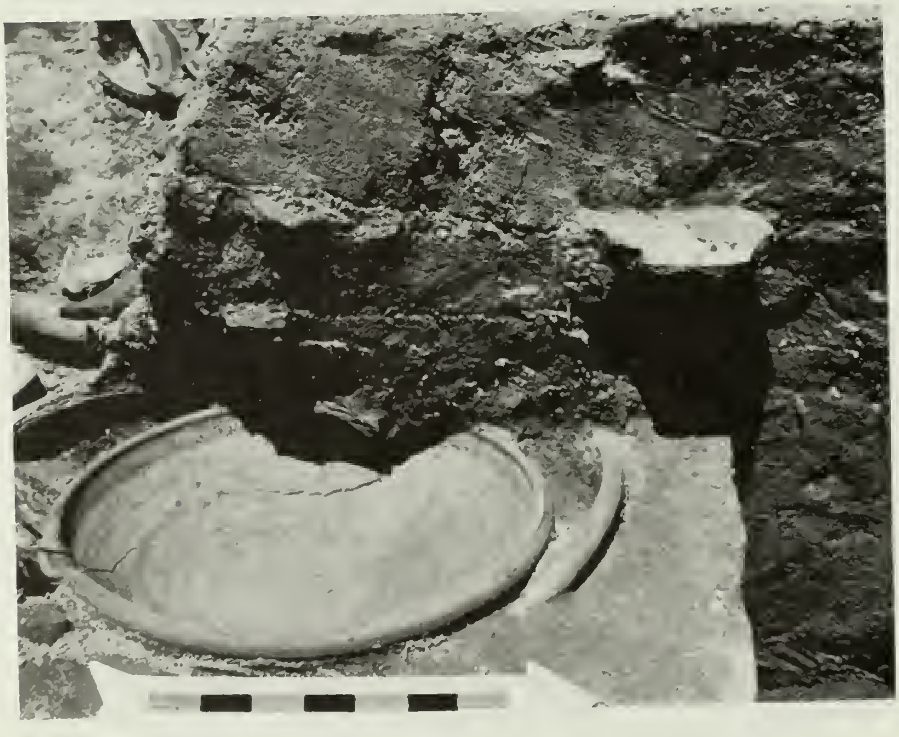


Figure 135. Waster Pit No. 1, bisque milkpans.

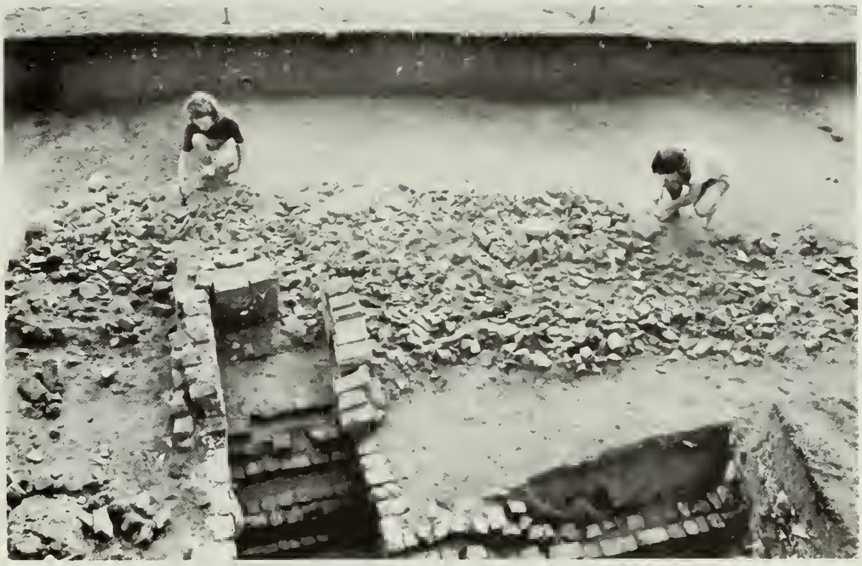


Figure 136. Surface of Waster Pit No. 2 in relation to 19th C. basement structure. Looking west.

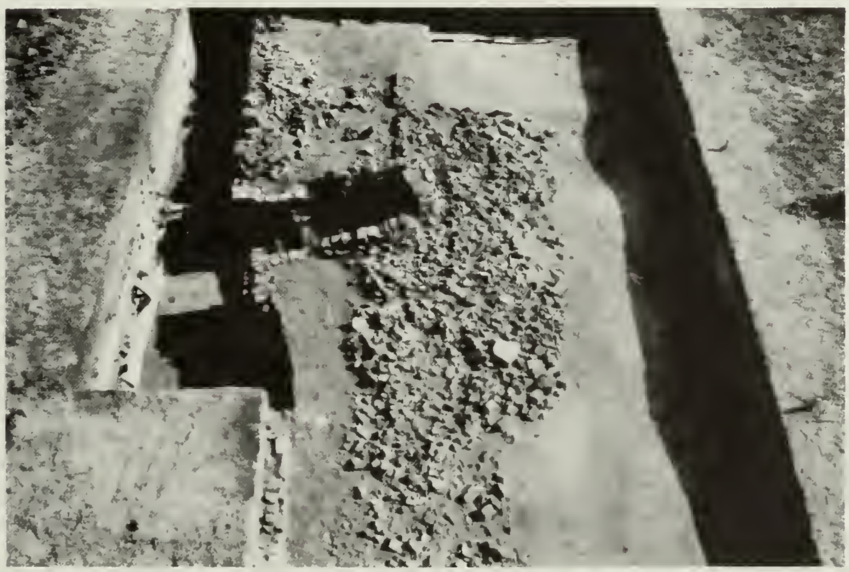


Figure 137. Waster Pit No. 2 with basemented structure (left). Looking south.

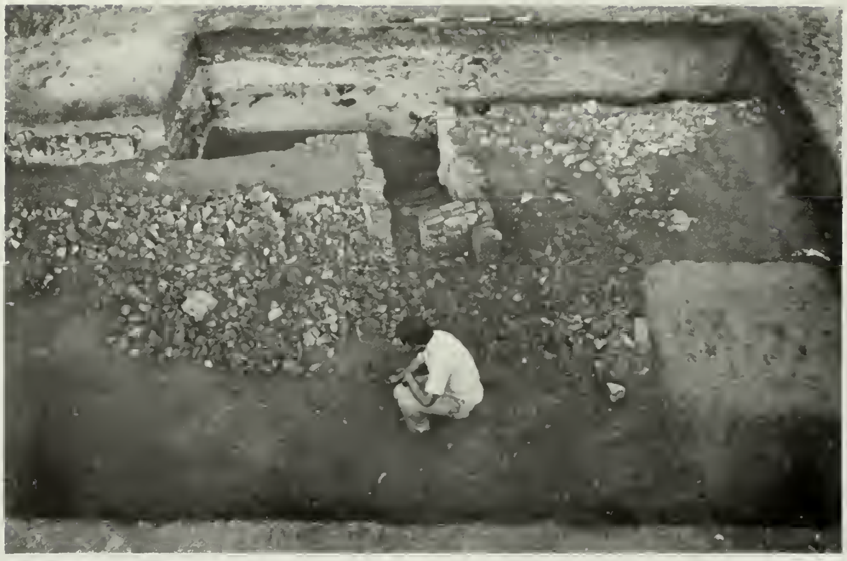


Figure 138. Waster Pit No. 2 and basemented structure. Looking west.

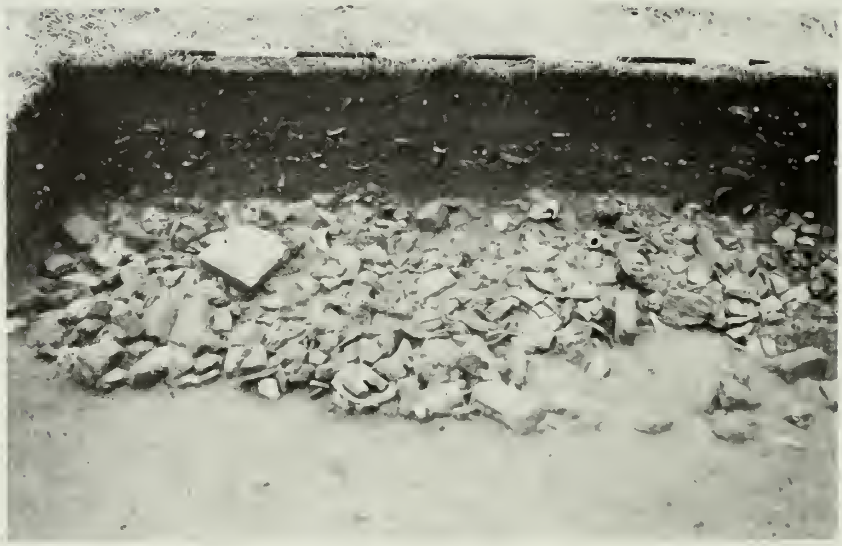


Figure 139. Waster Pit No. 2.

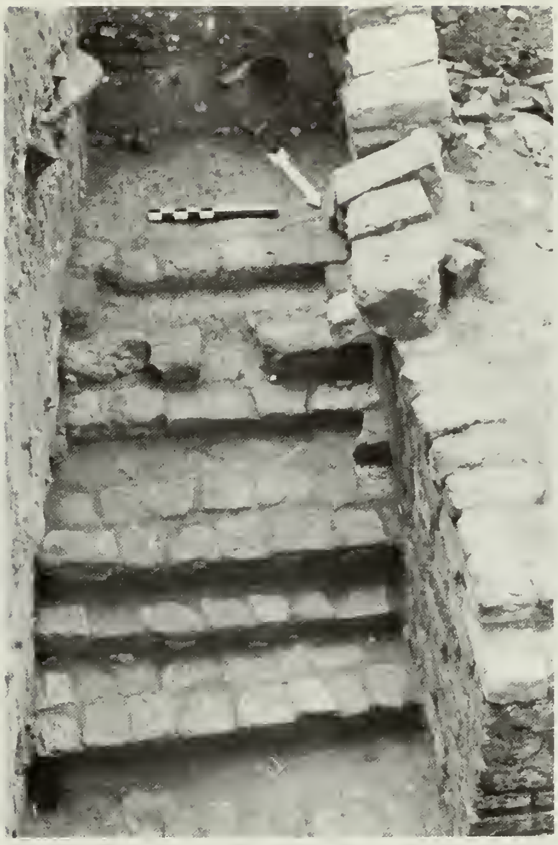


Figure 140. Steps leading to basement.
Looking west.

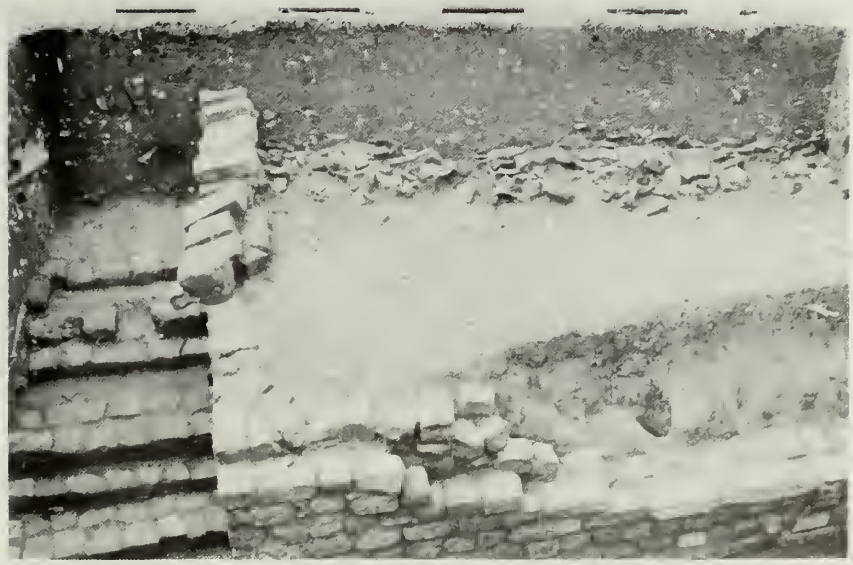


Figure 141. Basement and portion of Waster
Pit No. 2, looking west.

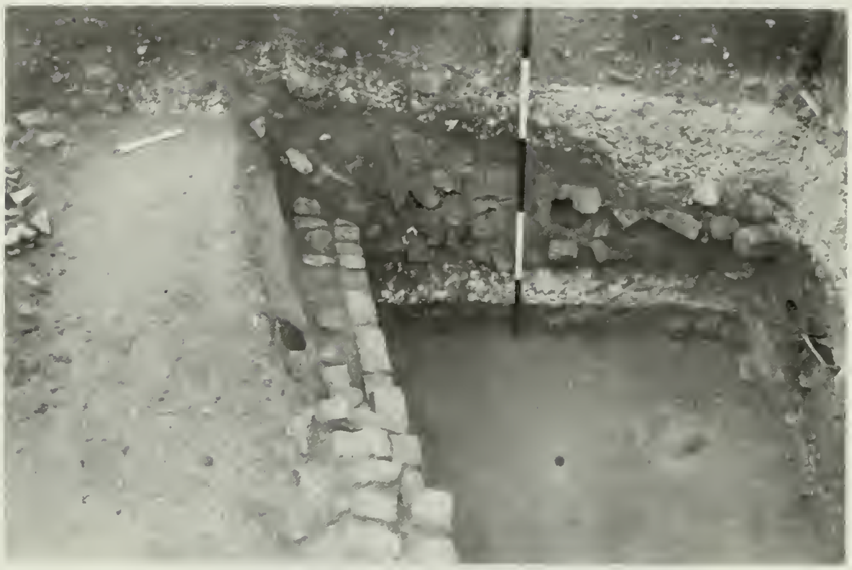


Figure 142. Stratigraphy within basement. Looking north.

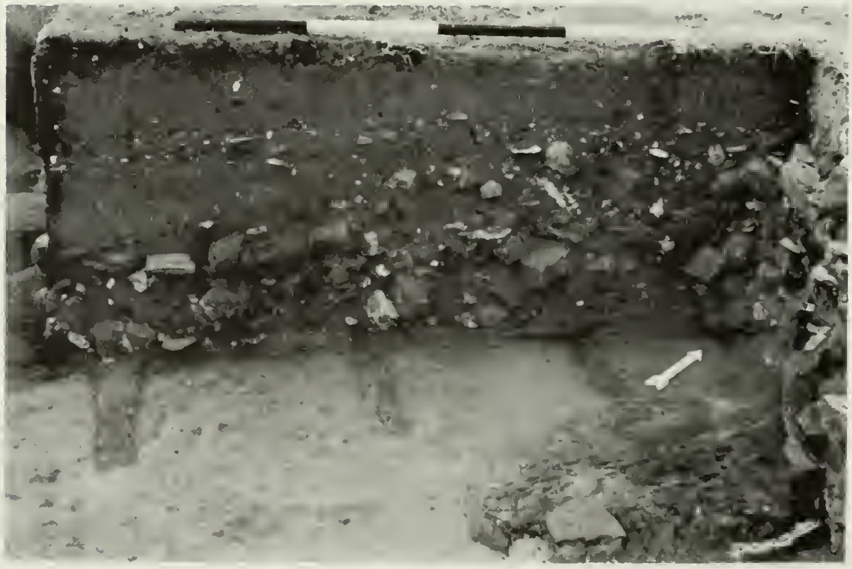
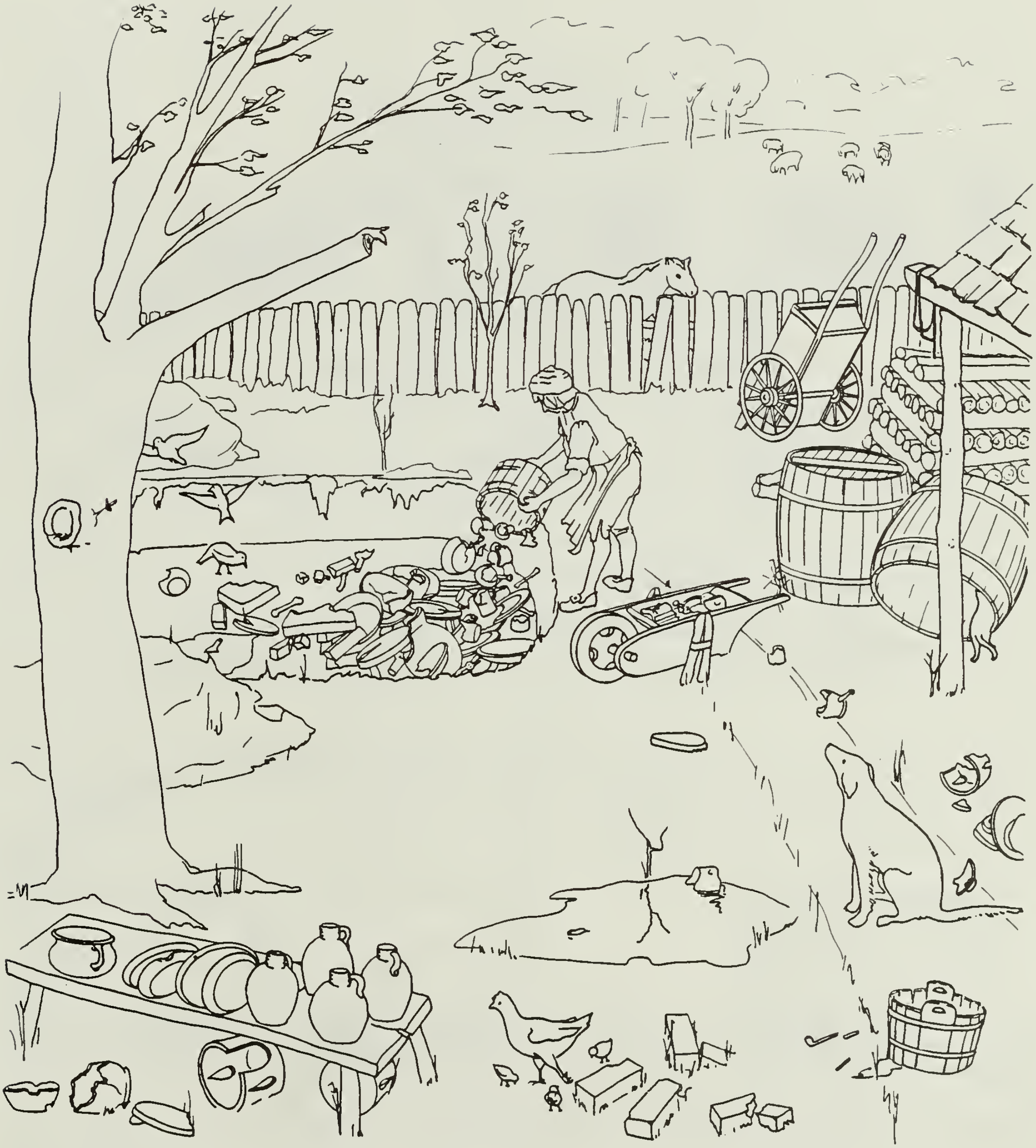
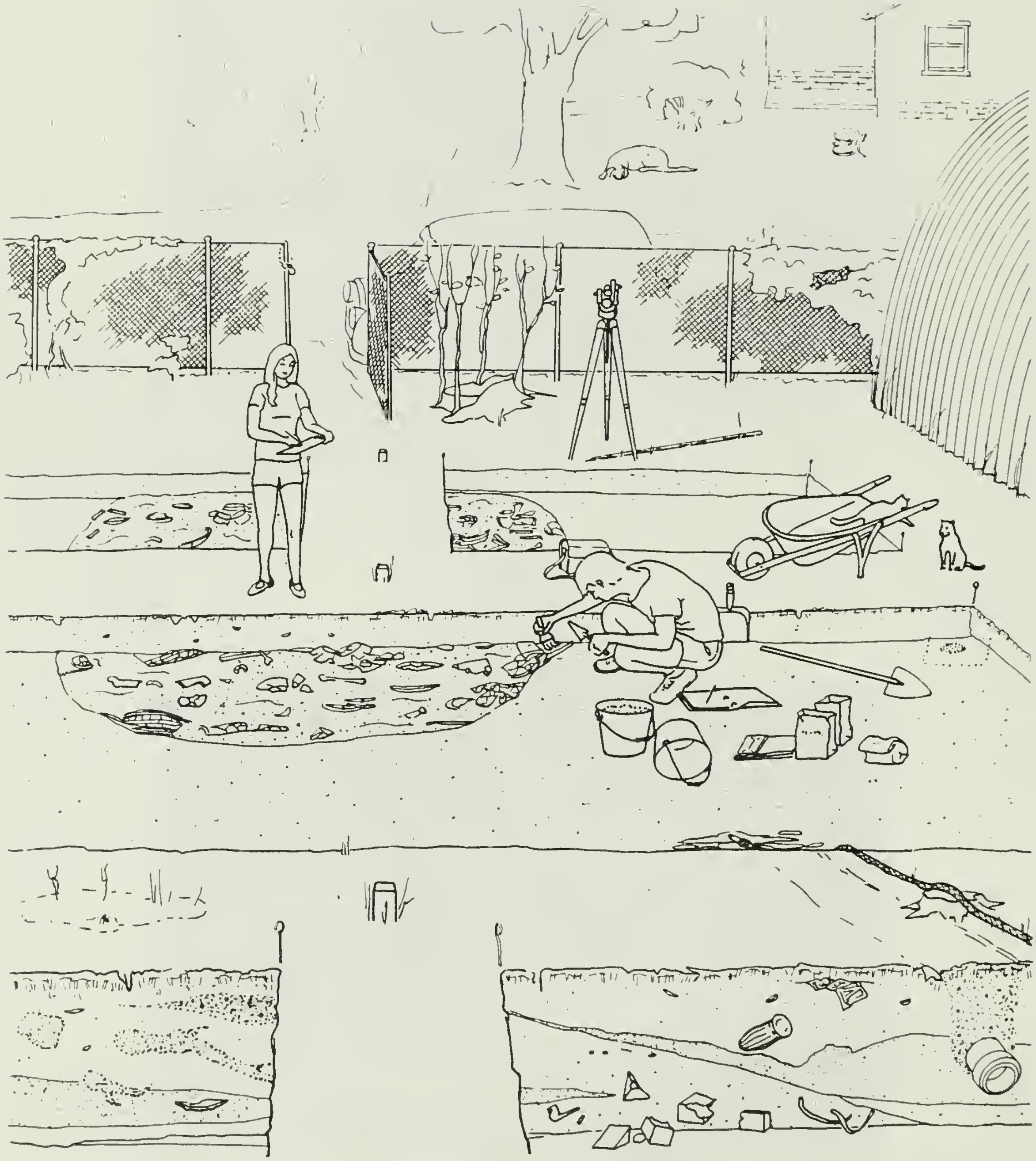


Figure 143. Joist stains in Structure 6 area. Looking north.



CREATION OF A WASTER PIT, c. 1730

FIGURE 144



EXCAVATION OF A WASTER PIT, 1980

FIGURE 145

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